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Good Foundations

An Analysis of the
Configurations of
Factors Affecting
Success in Non-
Traditional Students
on a Foundation
Programme

A thesis submitted in 2014
to the Department of
Education at
Durham University by
Catherine Ann Marshall for
the degree of Doctor of
Education (Ed.D.)

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Declaration

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Preface

Perhaps the greatest challenge yet to face the educational system of most nations is how best to address issues of equity and excellence within a context of diversity.

(Cushner, 1994b, p. 113)

I have enjoyed working in the Foundation Centre in all its incarnations for twenty years now, initially in its pre-Foundation phase as an Access course and then in versions of its current form since 1997. I have met so many students who have amazed me with how they juggle homes, jobs and extended families with studying. I would like to acknowledge and thank those students who have made the last two decades of work such a fulfilling and rewarding experience.

The team of staff who I have working with me are also inspirational in their dedication to providing an excellent education to allow non-traditional students access to an elite, research-led university and they are also deserving of my acknowledgement and thanks.

I started working at Durham University in 1994 on a part-time basis shortly after the birth of my elder son, Benedict Wesson. My second son, Douglas Wesson, was born in 1996 and I have fond memories of students hanging onto my maternity dungarees in order to stop me falling in the river during a fieldtrip a few weeks before he was born. I met my husband, Adrian Marshall in 2001 and he has supported me in my job, particularly engaging with Stephenson College events over the years. I am extremely lucky to have such a wonderful and supportive family who have given me the space and time to complete this Doctorate and I thank all three of them with all my heart.

CHAPTER 1: Introduction

1.1 The Rationale behind Widening Participation initiatives in Higher Education to increase social mobility

The educational needs of these disadvantaged students are qualitatively different and quantitatively greater than those of traditional university entrants.

(Ainley, 2002, p. 89)

The Foundation Programme at Durham University was developed as a widening participation initiative to provide an alternative route into the university for non-traditional students. I have been closely involved with the Foundation Programme since its inception in 1997 dealing with all aspects of the course, including marketing and recruitment activities, admissions, curriculum development, assessment and pastoral issues, and I have been the Director of the Foundation Centre since 2001. In that time, the rhetoric describing the rationale for running such a programme has altered slightly from an emphasis on individual fulfilment inherent in the ideas of the Lifelong Learning movement to aspects of social justice found in the current focus on Fair Access and using education to drive social mobility (Rogers & Horrocks, 2010).

Occupational status and social stratification are often justified on the basis of meritocracy i.e. that individuals earn their place in society based on their educational achievements rather than through social characteristics such as ethnicity.

Consequently, education is seen as an important mechanism to improve social status, with graduates able to benefit from higher incomes and higher status professions (Shiner & Modood, 2002). There are clear economic advantages for an individual to attain a degree in the increasingly service-based British economy (A. Milburn, 2009) and the many financial benefits for graduates have been described as including higher wages, with some estimates putting this in the region of £100,000, alongside greater job satisfaction and security (Cable, 2011). There are other less tangible benefits for graduates such as better health, lower crime levels and greater

involvement with their children's education. There is also evidence that having a greater number of graduates benefits society as a whole, with innovative countries having a greater proportion of graduates in their population, 37%, when compared with less innovative countries, 26% (Milburn, 2012). There is, however, evidence that the differential representation in Higher Education by certain groups has prompted a decline in the stagnation or decline in social mobility. While there has been considerable growth in the UK Higher Education sector in the last 40 years as shown in Figure 1, from 600,000 students at the beginning of the 1970's to over 2.5 million in 2012 (HESA, 2011), not all groups have benefitted equally from this increased provision.

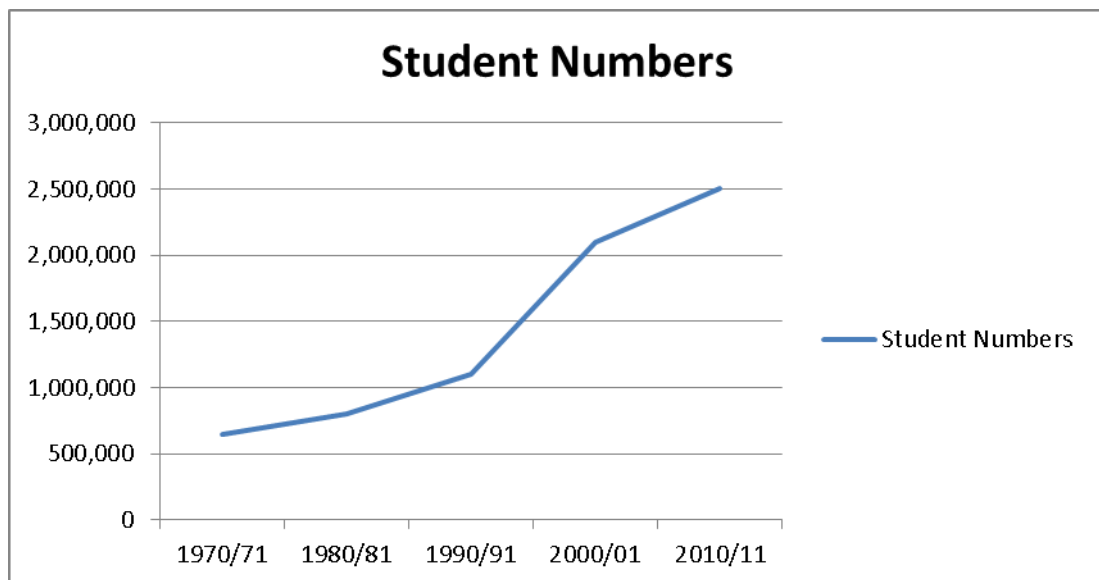


Figure 1.1 Higher Education Participation in the UK (Milburn, 2012, p. 20)

There is also evidence that while there were improvements in the rates for women and some ethnic groups, when considered as a proportion of a particular group in higher education compared with the proportion in the general population, this improvement is not seen equally across the sector and such students are more likely to be found in new universities, rather than older, more elite institutions (Tight, 2012).

Chapter 2 explores some of the literature on the issues of diversity in Higher Education considering which groups are underrepresented and some of the possible reasons for such underrepresentation.

Bourdieu's concepts of capital, habitus and field are drawn on to develop explanations for underrepresentation by some groups in Higher Education. Aspects of poor initial education have been considered, particularly given the disparity in A level achievement between different social classes in the UK. The second factor considered is that of potential bias in the recruitment practices of Higher Education Institutions which may be favouring some groups of applicants over others. The third factor is that of alienation by some groups with the dominant culture found in some Higher Education Institutions, causing some applicants to self-select either to new universities or out of Higher Education altogether (Hinton-Smith, 2012).

Whatever the reason behind the disparity in accessing Higher Education between different groups, it is important to ensure that non-traditional students who do decide to access Higher Education progress and succeed. This is important for the student, particularly in light of current fees of £9,000 per year, as dropping out will leave the student with a debt to pay, but without the graduate premium; for the institution, given the effect of higher rate of non-completion by non-traditional students on league table positions; and subsequent students, as pathways needs to be shown to be successful if they are to be maintained. For traditional undergraduates there is a heavy reliance on A level grades to predict suitability for the programme, but there is no consistent academic measure for non-traditional students. Consequently it is important that initiatives such as Foundation Programmes which do not use A levels to measure potential are evaluated thoroughly.

1.2 Mechanisms to Overcome Underrepresentation

If there is a need to increase diversity of participation in Higher Education for both social justice and economic reasons, there need to be mechanisms in place to support the process of widening participation and these can take place at several levels. While there needs to be change at the school level to improve A level attainment in state schools, the Milburn Report (2012) argues that universities can do much to widen participation. Chapter 3 considers some of the activities that can be used to widen participation from underrepresented groups, including the work of the Sutton Trust (2010) which analysed the effectiveness of types of outreach activity in terms of cost benefit ratio and showed that university access programmes linked to contextual admissions were the most effective.

Foundation Programme provision is an example of this type of activity and appears to be a cost-effective method of widening participation. Other initiatives have been found to be less effective, for example it could be expected that one way to attract debt-averse students from lower socio-economic classes would be to ease the financial burden with bursaries. The evidence seems to show that this is not the case. The Office of Fair Access (Corver, 2010) conducted a report into the effect of bursaries on the choices made by students from disadvantaged backgrounds and found that the introduction of bursaries had no effect on which universities such students applied to.

Foundation level study was flagged as an important mechanism for universities to adopt for improving access to Higher Education in the Government White Paper “Students at the Heart of the System” (Cable, 2011, p. 61). The paper recognised the need to improve access to higher education amongst the least well off young people and adults, and suggested Foundation Programmes as a means for Higher Education Institutions to engage with the National Scholarship Programme. This was expanded upon in a speech by the Minister of State for Universities and Science who

suggested that Foundation level provision would be instrumental in maintaining widening participation and access to Higher Education (Willetts, 2010). The Milburn Report (2012, p. 55) recommends that “action now needs to be taken to recognise, and embed into the mainstream, foundation year programmes more widely.” The report recommends that this can be accomplished by ensuring more selective universities put Foundation year programmes in place, by developing a section of the UCAS website devoted to Foundation Programmes to enable comparison of different programmes; and by ensuring that successful completion of a Foundation year at one university would be recognised as a qualification for entry to year one at other universities.

Once non-traditional students have been recruited, the next consideration is about how to teach them, particularly as the majority of the students are mature.

Consequently Chapter 4 considers the varied approaches to teaching non-traditional students and how they can be applied to a Foundation Programme.

1.3 Measuring Success in Foundation Programme Students

Given the focus on the importance of Foundation Programmes in the arena of widening participation, Chapter 5 considers which factors are likely to be important in a successful outcome for students who use them as a route into university. In order to evaluate the success of the Foundation Programme in this study it is important to articulate what change is needed during the Foundation year that will indicate that a student is appropriately prepared to begin their degree programme. While it is easy to list the subjective knowledge that a student will find useful or invaluable on their degree, the ideas about how they think become more nebulous. Various statements in the Foundation Centre literature give an idea of some of these aspirations; “Our focus is to encourage students to develop self-directed learning”; “We are looking for

evidence of understanding, independent analysis and originality”; “We encourage students to develop a critical thinking approach to their work” but the problem with all of these phrases is that they are vague and open to interpretation. The literature on gradueness and critical thinking skills are explored in order to try to articulate what the purpose of the Foundation Programme is beyond ‘giving’ students knowledge. The literature seems to demonstrate that critical thinking appears to be one of those concepts that is recognised when it is present, but it is difficult to articulate either a clear definition or a suitable way of assessing it. Ideas around concepts of evidence, threshold concepts and accepting ideas of measurement uncertainty are explored in Chapter 5 and applied to the notion that the purpose of the Foundation Programme in this study is to induct students into the community of practice of a research intensive university.

1.4 Using QCA to Explore the Configurations of Factors Affecting the Success of Non-traditional Students on a Foundation Programme in a Research Intensive University

Non-traditional students do not divide easily into distinct groups in terms of the factors that will be interesting to explore e.g. male/female; traditional qualifications/ vocational qualifications; home/ overseas; mature/ young, as students may be non-traditional in more ways than one (Egerton, 2000). One of the problems with research into underrepresented groups is the temptation to group them altogether when in reality they may have very different motivations, barriers and attitudes to learning. For this reason, Qualitative Comparative Analysis (QCA) has been used to analyse the data; being a case-led approach it maintains the distinctions within the data rather than aggregating them. Chapter 7 outlines the methodology of QCA and explains how it is applied in this thesis.

Chapter 8 describes the findings from the study and outlines the combinations of factors which are likely to lead to success for students during their Foundation year and subsequently on the degree. Chapter 9 then considers these results in relation to what should be taught on the Foundation Programme as well as how it should be taught. Ultimately this thesis shows that with dedication and hard work, non-traditional students can overcome a number of barriers to accessing education and achieve a degree from an elite, research-intensive university.

CHAPTER 2: Education and Social Mobility: Drawing on Bourdieu's Concepts to Explain the Relationship Between Them

Introduction

In the past decade the discourse on social mobility has informed much of the policy around education with the acceptance that, in order to cultivate a socially mobile society, there needs to be inclusive education to ensure that everyone has an equal opportunity to achieve the qualifications required for professions which provide wealth and status. Although there are debates about the nature of social mobility in the UK and its connection to education, most commentators agree that to achieve an inclusive education system there needs to be greater participation by some underrepresented groups in post-compulsory education. Despite numerous initiatives to increase participation in the past sixty years, there are still groups who are underrepresented in Higher Education and there is little apparent improvement in social mobility. This disconnection between increased educational opportunities and static social mobility was the main focus of the work of Bourdieu who postulated that it was not just that education had failed to improve social mobility, but rather that education was a mechanism by which the unequal status was maintained. He argued that it was important to “determine the contribution made by the educational system to the reproduction of the structure of power relationship and symbolic relationships between social classes” (Bourdieu, 1973, p. 71). He explored how this reproduction occurs across the formal education sector and outlined the process in compulsory education e.g. *Reproduction in Education, Society and Culture* (Bourdieu & Passeron, 1990) and in Higher Education e.g. *Academic Discourse* (Bourdieu, Passeron, & De Sant Martin, 1994). This chapter will explore Bourdieu's concepts of capital, both social and cultural, and habitus in the fields of education and how they can be used to account for current observations on the underrepresentation of some groups in education and how this might be linked to social immobility.

There are numerous reasons suggested for the underrepresentation of some groups in Higher Education and this chapter attempts to group them into three distinct categories. The first category is based on Bourdieu's assertion that the cultural and social capital possessed by advantaged groups can be converted into educational credentials and consequently the children of disadvantaged groups who lack these forms of capital do not receive an adequate education by the age of 16 to enable them to progress successfully in Higher Education. The second is based on Bourdieu's argument that reproduction of a stratified social structure is inherent in the educational system leading to a bias, either conscious or unconscious, against some groups in the Higher Education recruitment system. The third category draws on Bourdieu's concept of habitus to explain that some groups feel alienated by the predominant culture in Higher Education, which is focused on young, white, upper-middle class men studying full-time, (Hinton-Smith, 2012) and that consequently they make choices, again conscious or unconscious, not to participate.

There is a fourth possibility, that some groups are inherently less able than others i.e. the genetic component to intelligence is strong enough to create the disparity of participation observed (Herrnstein & Murray, 1994; Rushton & Jensen, 2005). This concept has been criticised extensively (e.g. by Fischer et al., 1996; Gould, 1996) and will not be considered further in this thesis.

2.1 Capital, Habitus and Field

Bourdieu's work explored the interaction between three concepts; capital, habitus and field, which he used to explain the maintenance of a stratified society. He expanded the notion of capital arguing that it was not just tangible economic capital which could be used to account for the structure of society in terms of which individuals or groups held power and status, but that so could other forms of capital which he referred to as cultural capital and social capital (1986). He used the term cultural capital to refer to those social assets which support social mobility beyond

economic means including aspects such as style of speech, dress, ownership of books or pictures, or knowledge of types of music and art forms; his term social capital referred to the social networks and connections within a group of people. His view was that there was misrecognition of the value of different forms of culture as being something intrinsic to that form e.g. piece of music, artwork or literature, whereas in fact it is arbitrary and defined by the dominant group. He argued that it is the dominant group which defines what is 'high culture' i.e. worthy of respect and study, as opposed to what is valued by the dominated group which is seen as 'low culture' and of less value. He proposed that in the education system it is those aspects of culture deemed worthy by the dominant group which are valued and studied (1976). This consequently means that individuals from the dominant group will have an advantage in education as their familial background will have allowed them to develop a habitus which values and leads to the acquisition of the cultural capital required to do well in education (R. Moore, 2004). Bourdieu's theory was that the different forms of capital were convertible e.g. cultural capital can be converted to educational qualifications leading to greater economic capital, and in the same way that children can inherit their wealth from their parents so too can cultural and social capital be transmitted within the family (1986). In this way, "cultural resources – especially educational credentials, selection mechanisms, and cognitive classifications – can be used by individuals and groups to perpetuate their positions of privilege and power" (Swartz, 1997, p. 190).

The concept of habitus was developed by Bourdieu to describe a "system of shared social dispositions and cognitive structures which generates perceptions, appreciations and actions" (1984, p. 279). These are the dispositions inculcated in an individual by the environment and culture in which they grow up, which Bourdieu describes as unconscious internalisations of the chances of success of an individual from a particular class. The habitus produces certain actions and attitudes within

particular fields, with Bourdieu describing fields as structured spaces with varying degrees of autonomy which produce their own values and behavioural constraints that are relatively independent from other fields (Naidoo, 2004). The concept of habitus is usually considered in terms of the effect that it has on an individual's behaviour, but it can also be applied to the behaviours of class groups, families and institutions (Reay, David, & Ball, 2005). Bourdieu uses the term field to describe the setting in which the interactions of capital are sited; the arena where the social relationships are structured in terms of power. An individual's role in a particular field is determined by the cultural capital they hold in that field and how well their habitus is adapted to it (Bourdieu, 1993).

2.2 Social Mobility in the UK

Bourdieu was one of the first sociologists to critically evaluate the post-war policies to reduce social inequality by expanding educational opportunity (Swartz, 1997) and noted that despite the improvements in educational levels since 1945, there were still social inequalities in terms of status and wealth. While his work was based on observations made in France, the UK has experienced a similar pattern.

There is a widely accepted view that social mobility has been declining in the UK (Blanden 2004) in recent years unlike the post-war years which saw a great deal of social mobility. This view, however has been disputed by Goldthorpe (2013) who argues that although that absolute social mobility has been on an upward trend since the end of World War II (Aldridge, 2003; John H. Goldthorpe, 2013) due to the change in employment focus in the UK to greater managerial and service industry and away from manufacturing; there has been a general shift upwards in the social classes in the UK, which has meant that there has been little change in the relative social mobility. As Aldridge states, "over the long term, there has been less

downward mobility as well as more upward social mobility – and, as a result, the relative chances of children from middle and working class backgrounds making it to the middle classes have changed little” (2003, p. 190). Consequently the increase in absolute mobility in the decades following the war has been confused with relative mobility and, as Goldthorpe (2013) argues, for rates of relative social mobility to increase there would need to be corresponding downward mobility to match any upward mobility. He reports data from a number of studies using different designs and data sources which provide a different picture of social mobility than that presented by Blanden *et al.* (Blanden, Goodman, Gregg, & Machin, 2004; Blanden & Machin, 2004). Essentially this evidence gives a picture of increasing rates of absolute mobility which have tended to plateau and largely constant rates of relative social mobility.

The evidence on economic mobility seems to indicate that the UK is one of the least mobile when compared to other economically developed countries. Empirical findings show, for example, that in the UK 40% of an individual’s economic status is determined by their parents’ status compared with a figure of 20% in Nordic countries (Corak, 2004). The evidence also seems to indicate that, compared to other economically developed countries, the UK has a greater disparity in terms of socioeconomic status and engagement with Higher Education as can be seen in Figure 2.1.

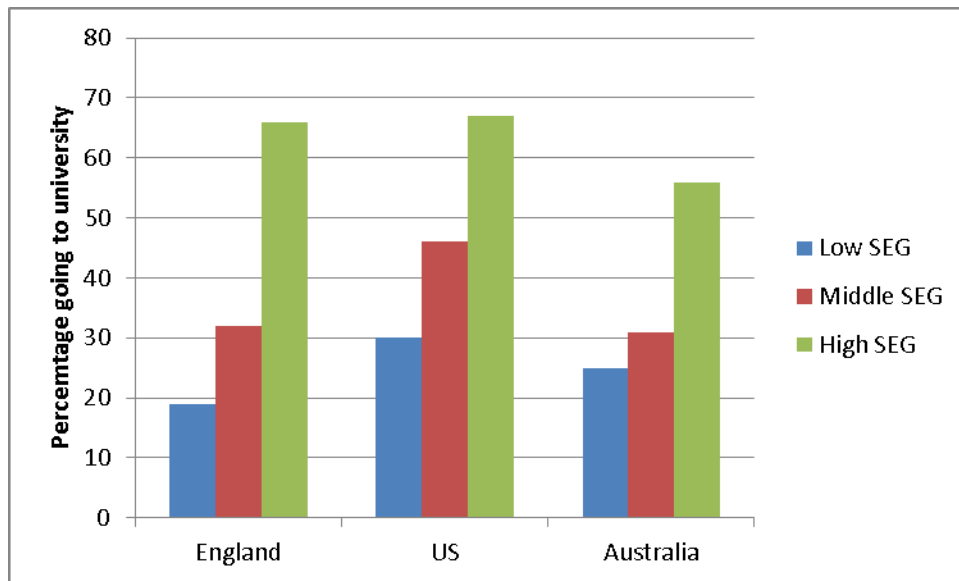


Figure 2.1 Higher Education Participation Rates by Social Class in England, US and Australia (Alan Milburn, 2012) University Challenge: How Higher Education Can Advance Social Mobility. London: Cabinet Office.

One reason for the difference demonstrated in Figure 2.1 may be that in the United States of America universities pursue a stated goal of constructing their admissions around achieving a diverse mix of students with different backgrounds and talents. This is based on evidence which indicates that diversity leads to a better educational experience, with students more likely to engage with their learning when exposed to people from different backgrounds and perspectives (Gurin, Nagda, & Lopez, 2004). In defending this position, Bollinger (2007) states that “it is far less important to reward past performance – and impossible to isolate an applicant’s objective talent from the contextual realities shaping that performance – than to make the best judgement about which applicants can contribute to help form the strongest class that will study and live together” (in Milburn, 2012, p. 48). Whether Blanden *et al.*’s or Goldthorpe’s interpretation of social mobility is correct, it would appear that social mobility is either static or declining and at lower levels than other developed countries.

The focus on widening participation to improve social mobility in the UK has led to a range of educational policies relating to Higher Education which has been reflected in all economically developed societies (Hinton-Smith, 2012). Historically the widening participation agenda became a political discourse in the UK at the turn of the 21st century following the expansion of educational opportunity in the latter part of the 20th century. More recently, the discussion has moved away from issues of equity and diversity to a greater focus on social mobility. This mirrors the move away from an industrial base for the economy to a more knowledge based economy and the concept of academic capitalism (David, 2012).

It has been argued (e.g. Archer, 1970; Jenkins, 1992) that Bourdieu's ideas are particular to French society, however, Robbins argues that his ideas are transcultural and transferable and that there has been a "tacit denial of Bourdieu's message... for 45 years" in the British system (2004, p. 428). This chapter considers the effect of capital and habitus of individuals in the fields of formal education in the UK.

2.3 Education Improves Social Mobility

The link between social mobility and education appears obvious; in a meritocratic society improving one's education should bring rewards of improved occupational and social status (Shiner & Modood, 2002). According to Neelsen (1975) there are five propositions underpinning this association of education and social mobility: "(1) that society is stratified; (2) that the system of stratification permits mobility or that it is essentially open; (3) that education plays an important role in mobility; (4) that education is an achieved status; and (5) that role performance is closely linked to education" (1975, p. 129).

In a study of social mobility comparing incomes of parents and their children, Blanden *et al.* (2004) found that education had a moderating effect on the correlation

between parent and child income so that for males with higher education levels, the increase in the correlation moderated from 0.132 to 0.110 and for females the corresponding amelioration was from 0.113 to 0.081. They attribute this greater moderating effect for females to the greater effect of widening educational opportunities in the latter half of the last century on female participation.

Blanden and Machin (2004) developed their ideas on the role of education in social mobility and educational inequality further by interrogating the data from the NCDS and the BCS and supplemented this data with a further data set from the British Household Panel Survey (BHPS). The BHPS was a study of income and education in all individuals aged 16 or over in 5,500 households. The data collection began in 1981 and has been followed up with subsequent data collection annually. The authors used data from 8 years of the study. They considered degree attainment by the age of 23 for those from the lowest 20% of parental income, the middle 60% and the highest 20% of parental income. The data collected in 1981 showed an educational inequality of 14 percentage points i.e. the lowest income group reported 6% having attained a degree by the age of 23, whereas the highest income group reported 20% attaining a degree by the same age. This disparity rose to 30 percentage points in 1993, and by 1999 there was an educational inequality of 37 percentage points. These data showed statistical significance, particularly over the longer term 1981 and 1999. The conclusion of the authors is that “degree attainment has become more closely linked to family income as participation in higher education has expanded,” (Blanden *et al.*, 2004, p. 242) and that “HE expansion has not been equally distributed across people from richer and poorer backgrounds. Rather, it has disproportionately benefited children from relatively rich families.” (Blanden & Machin, 2004, p. 230) Although they find that the association between income and participation is weaker when taking into account A level attainment, they contend that this finding is still present even when controlling for prior educational achievement.

So overall, the work of Blanden *et al.* seems to show that in the previous half decade it has become more difficult for an individual to move between social classes, that education can improve an individuals' chance to move between social classes but that the gap is widening between the rates of young people accessing Higher Education based on their social class. Although the correlation between this perceived reduced income mobility and inequality of participation in Higher Education does not show causality, there has been a strong focus of educational policy towards using education to ameliorate poor social mobility.

2.4 Which Groups are Underrepresented?

The generally accepted consensus is that non-traditional students in Higher Education include “women, ethnic minorities, mature and working class students and students with disabilities” providing one side of a dichotomy with “a privileged minority of young, white, western men without disabilities or without the constraints of employment or dependents” on the other (Hinton-Smith, 2012, p. 4). Although Bourdieu’s work focused on the dominant and dominated groups in terms of social class it has been argued that “it can easily be applied to the analysis of gender (or racial and ethnic) disadvantage as well” (McClelland, 1990, p. 105; in Reay 2004) and Dillabough contends that Bourdieu’s work is of “paramount importance” to understand “the problems of subordination, differentiation and hierarchy, and to expose the possibilities, as well as the limits, of gendered self-hood” (2004, p. 503). Reay considers that the inclusion of race and gender differences when studying habitus is particularly of importance when exploring smaller research contexts (Reay 2004).

Tight (2012) analysed the success or otherwise of widening participation in the post-war years for four key target groups; women, lower socioeconomic groups, mature

adults (who frequently study on a part-time basis), and ethnic minorities. He acknowledges that these groups do not give the full picture of disadvantage e.g. disabled students or rurally based students are not specifically included, but he focuses on the groups for which there is clear data since the end of World War II. He makes several points about the division into these groups not least that the converse of this grouping describes the traditional target of higher education as being “white, middle and upper class, young men studying on a full-time basis” (2012, p. 212) and yet these are the minority while aggregating the female, mature, ethnic and lower class groups makes a very clear majority of the population. A very important distinction to make is that individuals frequently fall into two or more of these categories making it difficult to disaggregate whether a disadvantage is due to sex, class, gender or ethnicity and Egerton (2000) noted that disadvantaged students are more likely to come to higher education as mature students.

2.4.1 Students from Low Socioeconomic Backgrounds

In the UK, socioeconomic status has been based on the National Statistics Socioeconomic Classification (NS-SEC) since 2001 (ONS, 2010). This system was devised by combining the two previous measures that were widely used; Social Class based on Occupation (SC) and Socioeconomic Groups (SEG). The NS-SEC was further refined in 2010 following a report by Rose and Pevalin (2005). The list below shows the version which is used for most analyses, although there are versions which sub-divide the major groups. For the purposes of comparing participation in Higher Education, these larger groups are adequate.

NS-SEC Analytic classes (ONS, 2010)

- 1 Higher managerial, administrative and professional occupations
- 2 Lower managerial, administrative and professional occupations
- 3 Intermediate occupations
- 4 Small employers and own account workers

- 5 Lower supervisory and technical occupations
- 6 Semi-routine occupations
- 7 Routine occupations
- 8 Never worked and long-term unemployed

Although there is evidence that participation in Higher Education has been improving for people from lower socioeconomic groups, there is still a great deal of disparity and the pattern of participation which demonstrates uneven distribution across types of Higher Education Institutions. Yorke (2012) compared the proportions of young people from lower socioeconomic groups in old and new universities and found that on average, new universities had 37.7% of their young people from the NS-SEC categories 4, 5, 6 and 7 compared with 22.0% for old universities. He also compared the increase in participation in the twelve years between 1994 and 2006 and found that for students from advantaged backgrounds the increase was from 50-55%, for those from disadvantaged backgrounds the increase was from 13-16%.

Taylor characterises many Higher Education Institutions' widening participation initiatives as targeting local schools and students and she claims "the term 'local' is seemingly used rather euphemistically to refer to non-traditional, disadvantaged working-class groups" (2012, p. 74). There is good evidence for making this link between "local" and "non-traditional disadvantaged working-class" as students from non-traditional backgrounds are most likely to be geographically grounded (Pollard, 2008).

Students from lower socioeconomic backgrounds report that the difficulty of managing student finances constituted a major barrier and many reported real issues of poverty as students. The issues of poverty affect students directly in terms of being able to afford the equipment necessary to participate and pay the bills

associated with studying; and indirectly in terms of making students time poor when they are obliged to take on work to make ends meet (Bowl, 2003).

2.4.2 Ethnic Minorities

The increase in upward social mobility for ethnic groups in Britain has been observed since the 1960s with education seen as a major driver (Shiner & Modood, 2002).

The efforts of economic migrants to better themselves and their identification of education with improved social mobility is one of the explanations given for the overrepresentation by ethnic minority students in HE; nearly twice the proportion of University entrants compared with the general population of ethnic minority 18-24 year olds (Shiner & Modood, 2002). Part of this is also explained by the better achievement at A level by some working-class ethnic minority students when compared with working class white students, although other black and minority ethnic (BME) students were found to be more likely to attend FE college than sixth form (Bhattacharyya, 2003) and less likely to follow an A level route. However, the pattern of participation for minority ethnic groups is not evenly distributed across Higher Education Institutions, with a greater proportion found in new universities and, as a consequence, producing underrepresentation in elite universities (Shiner & Modood, 2002).

Bowl (2003) described a project which focused on supporting disadvantaged groups in Birmingham to improve their employment prospects and included support into higher education. She presented the results of interviews with thirty-seven students of working class backgrounds who were predominantly female, bringing up children single-handedly and of African-Caribbean or South Asian origin. The research was conducted over a couple of years between 1997 and 1999. Students from non-white origin described feeling different and marginalised during their initial education, experiencing the disadvantage outlined by the Swann Report (1985) experienced in schools by children of ethnic minorities. Students reported being subjected to

teachers' racist stereotypes and on occasion direct racist treatment, however, despite there being evidence that this can lead to an anti-school subculture, Bowl reported that the students in her study remained committed to education.

2.4.3 Female Students

At the beginning of the expansion of Higher Education in the 1960s, women were in the minority compared with men (Tight, 2012). Five decades on the situation is reversed and now commentators are beginning to discuss men as the underrepresented group (Gorard, 2008). However, the picture is more complex as there is uneven participation by men and women in elite universities, with women being less well represented (Tight, 2012).

Bowl reports that women entering higher education later in life are frequently directed into poorly paid forms of employment with poor career structures, such as childcare, catering or shop work. In her interviews she noted that subject choices were strongly influenced by career goals and the "desire to escape from the trap of benefits, low status and low pay in which most of them found themselves" (2003, p. 65).

A different study by Woodfield exploring mature women's motivations for participating in Higher Education did not find a desire to improve employability to be such a strong influence, there was a range of priorities, not least a community-based reason of "giving something back" (2012, p. 94). Yet another study showed a strong impact of parent status with Hinton-Smith (2012) describing research showing that becoming a parent or lone parent was the greatest trigger for educational engagement. Given the large numbers of women in Higher Education it is likely that women from different social classes and cultures are likely to have different triggers and motivations for participating in Higher Education, but most studies indicate that women do well as mature students: "Whilst the predominantly female students are not richly endowed with 'cultural capital' (Bourdieu, 1992), they are resourceful, determined, persevering

and strongly focused. Having overcome significant challenges to get to university, such women students are determined to succeed and achieve good degree results” (David, 2012, p. 29).

2.4.4 Mature Students

Adult learners have been studied over the past few decades and it has been demonstrated that there are personal, social and economic benefits when adults return to learning (Knightley, 2006). Much of the focus of this work has been on raising the aspirations of the learners rather than changing the cultures inherent in the educational establishments (Tett, 2004). Yet there is evidence that Higher Education may benefit from mature student participation.

A study to explore retention in Higher Education (David, 2012) showed that while students from lower socioeconomic backgrounds were less likely to be retained than more traditional students, this difference was less marked in mature students. This may be because they are making up for their lack of cultural capital with other skills and qualities such as time management skills.

Richardson (1994b, 1994c, 1995a) conducted a series of studies into the approaches to studying adopted by mature students. He concluded that mature students were more likely to adopt a deep approach or meaning orientation to learning than their younger peers. This finding was endorsed by a subsequent study comparing students on the same course which concluded not only that mature students adopted more desirable studying approaches e.g. deep approaches, than younger students, but they demonstrated similar completion rates and academic performance as younger students. Further work (Sadler-Smith, 1996) also found the pattern of a mature students being more likely to adopt deep learning approaches. Richardson and King therefore argue that “higher education will actually be enriched by the admission of mature students” (Richardson & King, 1998, p. 69).

2.4.5 How Unfair is this Representation?

Gorard (2008) contends that the unfair underrepresentation of particular groups in Higher Education has yet to be established, pointing out that the demographic landscape in the UK has changed considerably in the post-War years making it difficult to make comparisons across time. There are difficulties in defining and measuring social class as well as defining and measuring participation in Higher Education. Not only do experts disagree on how to categorise social class, but the definitions have changed over time and Gorard (2008) points out the difficulty of using social class with respect to students; for young students it makes sense to use their parents' classification (and should it be mother or father?) whereas for mature students it should be their own; leading to problems of decisions of at what age to apply a students' own or their parents' classification as well as issues of comparing different data. There are also issues of which population to use for investigation; focusing on the traditional Higher Education age group of 17-21 would miss important Widening Participation groups who tend to participate at later ages than traditional students, yet including everyone to 50 would be irrelevant to the majority of the population. When investigating participation in Higher Education decisions need to be made as to what Higher Education qualifications to include, courses such as pre-degree courses in Higher Education institutions or Higher Education courses in Further Education institutions, for example, may make a considerable difference to the outcome of the data.

Gorard argues that as 92% of the population as a whole is white, based on the 2001 census, yet they make up 84% of UG population, the "majority white group is the most obviously underrepresented" (2008, p. 429). He also notes that the increased participation by women in HE has led to an underrepresentation of males across all categories. Given the data available to him, Gorard notes that the odds ratio of enrolling in a degree between the higher three social groups and the lower three

social groups fell from 7.9 in 1990 to 4.4 in 1999 indicating that social class participation in HE is improving. The inequality is still apparent; data from the 2001 census showed that 50% of those aged 18-19 in the higher three social groups were accepted to degree courses compared with 19% of the lower three social groups. However, he makes the point that if the data on non-classified or not valid social classifications are included it highlights the problem that 67% of students in a study in 2002-3 did not have a recognisable social class and he argues that the incomplete data makes it hard to draw concrete conclusions. The lack of data is an issue, but the same can be said of many studies, and regardless of the interpretations of the data the Higher Education sector is keen to address the perceived problems.

Tight (2012) differs from Gorard (2008) in his assessment that there is no consistent pattern of underrepresentation in higher education among socially disadvantaged groups focusing on Gorard's qualifier "once prior qualifications for entry are taken into account" (2008, p. 436), finding that this is the key point for many students. He reaches the same findings as Gorard in that the picture for women and ethnic minorities does not indicate underrepresentation, however he does qualify this with some concerns about women's underrepresentation in certain institutions and the fact that ethnic minorities, like women, are overrepresented, but they are concentrated in the new universities maintaining a level of inequality of opportunity i.e. that professions providing wealth and status are more likely to recruit from elite universities (Milburn, 2009). Likewise, although there have been some advances for mature students, they too tend to be concentrated in new universities and as part-time students "remain unfairly treated in funding regimes in comparison to full-time students" (Tight, 2012, p. 223). Where Tight differs very widely from Gorard is the assessment of the underrepresentation of lower socioeconomic groups in higher education. He acknowledges Gorard's point that it is prior academic achievement which provides the barrier for this group to access university; however, there is

evidence that, while there is correlation between A level scores and achievement in Higher Education, this correlation is less marked for young people from disadvantaged backgrounds (Milburn, 2012).

Gorard (2008) makes the point that the widening participation picture may be distorted by the decisions researchers make on which groups to include, and that it is important for policy decisions to get a true picture; if there is underrepresentation due to lack of aspiration or discrimination by institutions then the policy needs to be directed at HE institutions to develop outreach work and improve diversity and equality training; if it is due to lower qualifications, the emphasis needs to be on strategies to improve initial education. Consequently there needs to be a greater understanding of why there is a differential in the figures of different groups of students in Higher Education.

2.5 Reasons for Underrepresentation

2.5.1 Cultural Capital and Inadequate Compulsory Education

All children in the UK are required by law to receive education to the age of 16, but the question is whether all children receive an adequate education to enable them to continue their education beyond that. In a paper outlining the different forms of capital, Bourdieu described how his notion of cultural capital arose as a theory “to explain the unequal scholastic achievement of children originating from the different social classes by relating academic success...to the distribution of cultural capital between the classes” (1986) and he has written extensively on the issue of how the cultural differences between social classes is maintained in the education system, causing inequity in educational experience and reproduction of the class system (Bourdieu & Passeron, 1990). He postulated that education has an internal function of preserving, indoctrinating and consecrating a cultural heritage and an external

function of reproducing class inequality, by reinforcing unequal distribution of cultural capital (Swartz, 1997).

Bourdieu argues that the cultural capital given to middle class children enables them to access the education offered by the system and that schools do not promote and reward natural ability, but social ability. Children of lower social classes must acquire, through education, certain knowledge, language and ways of behaving, which children of higher social class receive as a matter of course through their upbringing. This is enforced by parental attitude, peer groups and teachers.

Consequently a child of lower social class must do far better than a child of higher class to reap the same rewards (Bourdieu, 1976). "Social classes differ greatly in levels of educational attainment and patterns of cultural consumption. Bourdieu finds that students' academic performance is strongly related to parents' cultural background. Parents pass on their cultural heritage to their children..." (Swartz, 1997, p. 198).

Other research has upheld these ideas, for example, Wiegand showed that middle class children tend to express understanding of geographical relationships earlier than working class children and they tend to express liking for other countries more than working class children; "It seems reasonable to assume that this is related to home experiences such as the availability of books and illustrations, travel experience, opportunities for discussion and so on" (1992, p. 63).

The A level system favours the middle class

Bourdieu was critical of the way that the national examination system in France presented advantages to those students who had greater levels of cultural capital, arguing that examinations "tend to measure ability in linguistic expression as much as mastery of subject matter" (Swartz, 1997, p. 200). Students who use articulate and varied language may be perceived as being innately more intelligent, when their

language is likely to be highly dependent on cultural capital (Bourdieu, 1976). He argued that examinations give the impression of being meritocratic while they actually favour the culturally privileged because “examiners are generally obliged ...to lower their standards as far as knowledge and know-how are concerned, but hold fast to their requirements as regards form (Bourdieu & Passeron, 1990, p. 73).” Consequently two students may understand the same concept and be writing about the same facts in an examination, but the student who has the benefit of a more sophisticated style will receive more marks.

Bourdieu’s concerns about examinations favouring students who come from higher classes may have relevance in the UK, where GCSEs and then A levels are used as the main basis for measuring potential to do well at University. There is evidence that achievement in these examinations is unequally distributed across different classes of students. According to Universities UK (2009), only a third of children eligible for free school meals (FSM) – used as a measure of socioeconomic deprivation - achieve five A-C grade GCSEs at the age of 16 compared with two-thirds of other children. This disparity continues to be observed at the age of 19, with 32% of FSM children attaining a level 3 qualification compared with 57% of other children. In 2011, only 4% of FSM children achieved three grade As at A level which was less than half the rate of the rest of young people who attended state schools (Milburn, 2012). At the other end of the scale, the 11% of A level students who are privately educated account for 32% of students who achieve at least three grade As at A level and 39% achieving three A star grades (Milburn, 2012).

The Effect of the National Curriculum

Many educationalists see the introduction of a National Curriculum as further weakening the disempowered members of society and promoting the values of the elite who introduced it (Apple, 1993; Goodson, 1998). In Goodson’s description of the introduction of the National Curriculum in the UK, he questions whose nation is

being referred to, with the implication that it holds little relevance for those outside of the upper/ middle socioeconomic classes. He argues that it imposes social prioritising with regard to class, race, gender and region. The introduction of a national curriculum could be seen as an example of what Bourdieu described as symbolic violence; the imposition of one group's curriculum on another, and he asserted that "All pedagogic action is, objectively, symbolic violence insofar as it is the imposition of a cultural arbitrary by an arbitrary power" (1990, p. 5). In Apple's (1993) discussion of the potential introduction of a National Curriculum to the USA, he argues that the introduction of testing would lead to further division between those with resources and those without, and the consequent labelling of the children at those schools. The reason he gives for this is that while testing may appear to be objective, given the inevitable division of schooling based on differences in resources, the more disadvantaged will have less access to better schooling and inevitably perform less well in tests. If Apple and Goodson are correct, then the students from working class backgrounds who have been taught the National Curriculum during the past 20 years in the UK are likely to have become more disconnected from education.

2.5.2 Recruitment leading to Reproduction of Society

Selection Based on Cultural Capital in France

Bourdieu considered ways in which the education system reproduced society's structure in terms of how students were selected for university; he explored the examination system, the notion of facilitating subjects, the importance of language, and discrepancies in the types of Higher Education Institutions attended by different groups of students. He observed that in France the general curriculum required for elite Higher Education Institutions was dominated by humanist studies, which were less likely to be studied by students from a disadvantaged background; such

students were more likely to study technical or vocational subjects which would provide them with skills that were required by the job market. He also made the point that possession of cultural capital would provide an advantage to students studying humanist subjects, both in terms of content matter and having the language skills to express themselves in an academically acceptable format. Bourdieu argued that these differences led to elite institutions selecting those students with advantages of cultural capital, whereas disadvantaged students received their Higher Education from less prestigious institutions. He made the observation that this then had an impact later in life noting that “the *type* and *prestige* of educational institution attended are as influential for later careers as are the number of years spent in schooling” (Swartz, 1997, p. 193). He made the further point that because of this bias towards those who demonstrate a greater facility with language, those disadvantaged students who do reach elite Higher Education Institutions would have undergone a more rigorous selection than those from a background with greater cultural resources (Swartz, 1997).

Selection in the UK

There have been studies conducted to explore whether these effects can be seen in the current UK Higher Education system and the focus has been to consider A level qualifications of applicants and the type of school attended. It has been suggested that UK Higher Education Institutions and the UK government are ambivalent about non-traditional students, valuing their status as subjects of research, but then tolerating them rather than prizing them (Woodley & Wilson, 2002) and that they prefer to focus recruitment activities on the easiest students - high-scoring A level students who need the least support to achieve a good university standard (Watson, 2007). There is evidence that even when students from state schools do achieve the A levels required for elite universities, they are still underrepresented. The Sutton Trust (2004) refers to a missing 3,000 state school students who achieve the grades

required for the top universities in the UK, but do not gain a place, concluding that the university admissions process acts in favour of privately educated school students. A further problem with process of using A levels as the measure of potential is that evidence indicates that students from state schools perform better in final degree outcome than privately educated students with the same grades. There appears to be an effect of teaching in the private sector which enhances students' performance at A level, but which does not persist through university (Hoare & Johnston, 2011; Ogg, Zimdars, & Heath, 2009).

A study by David (2012) considered prior educational experience and attainment as a factor in accessing Higher Education for students from different socioeconomic contexts. Although children from low socioeconomic backgrounds are less likely to go to university, David's study showed that controlling for prior attainment eliminated the disparity. They also found, however, that students from lower socioeconomic backgrounds were more likely to attend lower status universities and they demonstrated that the unequal access to higher status universities was dependent on prior educational experiences in state schools rather than in Higher Education recruitment strategies. It can be argued that the competitive nature of Higher Education entry, based on prior qualification, will lend itself to differential patterns of participation, as there are clear differences between rates of A level participation and attainment between different social groups. Bourdieu's concept of different types of capital being interchangeable can be applied to independent education; where the economic capital of parents is exchanged for educational capital for their children. As the higher social groups gain more A levels they will be overrepresented in Higher Education (Gorard, 2008). "Students from traditionally disadvantaged backgrounds tend to enter Higher Education with weaker academic qualifications and, hence, to enter the less prestigious institutions" (Yorke, 2012, p. 37).

An example of the discrepancy between a private education and a state education is the different educational capital in terms of the subjects taken in the two types of schools. The Russell Group of universities (2011) states that there are 'facilitating subjects' which are likely to be a requirement for entry to selective universities, specifically, maths, individual sciences, English, other languages and history. Students studying their A levels at comprehensive schools are less likely to study these subjects, for example, in 2011, only 40% of students studying at comprehensive schools took one or more of the individual sciences compared with 63% of those at private schools (Milburn, 2012). This means that state school students are more likely to be disadvantaged when applying to university, as they will not have studied the subjects that are required to gain entry.

Admissions Bias Generally

Shiner and Modood reported studies of admissions procedures which relied to a certain extent on individual discretion on the part of the admissions staff, with different practices and approaches within the same institution and even the same department, which were likely to lead to direct and indirect bias towards certain groups. They conducted an analysis of applications from traditional-age university applicants in the academic year starting 1996 and found that ethnic minority candidates were overrepresented in the HE as a whole, but disproportionately concentrated in new universities, reflecting both patterns of application and a "greater commitment among new universities to widen the social and ethnic basis of participation in higher education" (2002, p. 227). The picture for ethnic minority students applying to old universities however, showed an "ethnic penalty" (2002, p. 227); they needed to perform better than their white counterparts to secure a place. Shiner and Modood were clear that their work did not provide a causal mechanism rather that they were describing differences between groups. They recommended that the situation was investigated further as the "country's 'top 2000' companies

recruit overwhelmingly from among old university graduates” (2002, p. 228). Since then universities have been working on providing more transparent and consistent procedures, although the work by Boliver (2013) would indicate that there is still an element of systematic discrimination against some groups.

Admissions Bias in Elite Universities

In an analysis of UCAS data, Boliver (2013) investigated the degree to which this underrepresentation was a result of choices by the candidates, or decisions by the universities. Her results showed that those from lower social class backgrounds were less likely to apply to Russell Group universities, that those from Black, Pakistani, Bangladeshi backgrounds were likely to apply, but less likely to be offered a place and those from State Schools were both less likely to apply and less likely to be offered a place once they had applied. This was not based on inequalities in prior achievement; “applicants from state schools...seem to need to be better qualified than their private school counterparts by as much as an A-grade A level before they are likely to apply to Russell Group universities” and when they do apply “they seem to need to be better qualified by as much as a B-grade A level before they are likely to receive offers of admission” (Boliver, 2013, p. 359). Obviously the reasons behind these differences are likely to be complex. For example qualitative research (Archer, 2007; Archer & Hutchings, 2000; Archer, Hutchings, & Ross, 2003) indicates that the types of universities typified by the Russell Group are likely to be perceived as the “preserve of the privately educated White upper-middle class” (Boliver, 2013, p. 347) which may put off BME students or students from lower classes from applying. Boliver also makes the point that one reason for the disparity may be the differential between predicted grades for students at independent schools and others. The work of Bourdieu would suggest that the content and language employed by applicants in the personal statements of their UCAS application forms may also lead to variations in selection of students from less culturally advantaged backgrounds. This was the

contention of the Sutton Trust in their report of a summary of research into UCAS personal statements (Jones, 2013). They demonstrated that in three main areas likely to be affected by cultural and social capital i.e. fluency of expression, work-related activity and extra-curricular activity, there were large discrepancies between students from state and independent schools.

Students from working class backgrounds often lack the support at home to enable them to negotiate a pathway through education. The students in a study by Bowl (2003) repeatedly describe missed opportunities due to lack of knowledge or understanding of choices. Bowl argues that teachers and schools have greater control over the choices of working class students than their middle class peers because of the informational disadvantages of the parents of such children. This lack of information continues through to the higher education experience meaning that students have little information about what to expect or how to access support.

Recruitment versus Retention

There is a view that, at least for some institutions, there has been a greater emphasis on recruiting non-traditional students rather than ensuring an appropriate student experience to ensure retention (Reay, 2003; Taylor, 2008) and that while recruiting students from non-traditional groups was primarily a quota-filling exercise there was no recognition of the difficulties faced by some students to engage with a Higher Education model which had been developed to meet the needs of a 'traditional' student (Edwards & Usher, 1993). Hinton-Smith likens the situation to that of the social model of disability in its assertion that "social institutions have a responsibility not merely to open their doors to disabled individuals but to ensure that conditions facilitate full participation by diverse differently abled members" (2012, p. 4) and points out that commentators on widening participation have frequently criticised assumptions that non-traditional students can be easily incorporated into Higher

Education and argues that it is important that the environment need to be tailored to address their needs.

Taylor (2012), like other commentators on widening participation (Archer & Hutchings, 2000; Lynch & O'Neill, 1994), contends that by focussing on raising aspirations of individuals from disadvantaged backgrounds, there is an implication that there is, in fact, equal access for everyone which does not address the reality of the barriers in place for non-traditional students. Lynch and O'Neill argue that for working class students it is a lack of resource which “underpins their sense of powerlessness and isolation [and] which excludes them most of all.” (1994, p. 20). The risks and benefits associated with Higher Education participation are unequally distributed across social class and, as such, Higher Education often remains a more difficult, ‘risky’ and costly choice for working-class students. “Nonetheless, many formal initiatives draw on meritocratic discourses, identifying ability to participate solely in terms of academic achievement, motivations and desires” (Taylor, 2012, p. 74).

The importance of these findings is the impact on the approach to fair access, with a strong focus on outreach work and bursaries which may make students more likely to apply, but if there is still discrimination at the decision level, this will not improve fair access.

2.5.3 The Effect of Habitus – Alienation of Alternative Learner Identities

“‘Oh that’s crabs for you...Thick as planks...that’s why you can keep them in a bucket without a lid. Any that tries to get out gets pulled back.’ ...Crab bucket, thought Glenda...that’s how it works...Practically everything my mum

ever told me, that's crab bucket...The worst of it is, the crab that mostly keeps you down is you."

(Pratchett, 2009, p. 218)

In the previous section there was evidence that some of the underrepresentation of students from certain groups may be due to the fact that they just do not apply to certain elite institutions and this relates to one of the key themes running through Bourdieu's work on the education system which emphasises the role of self-selection by the student in academic choices. Choice of institution, choice of course, retention or withdrawal and, in fact, whether to apply to university or not is shaped by an individual's expectations of whether someone from their social background is likely to succeed academically or not. This self-selection can be explained by Bourdieu's concept of habitus which he describes as the "totality of learned habits, bodily skills, styles, tastes, and other non-discursive knowledges that might be said to 'go without saying' for a specific group" (1990, pp. 66-67). Bourdieu considered these ideas to be largely unconscious and a permanent aspect of an individual and so argued that "educational choices are dispositional rather than conscious, rational calculations" (Swartz, 1997, p. 197).

The Effect of Habitus on Attitudes towards Education

In "Reproduction in Education, Society and Culture" Bourdieu and Passeron describe the concept of habitus as a way of perceiving, analysing and acting on the world around us. They describe the pedagogic practices of the family as being greatly influential on the formation of an individual's habitus (Bourdieu & Passeron, 1990). "Once acquired, it [the habitus] underlies and conditions all subsequent learning and social experience" (Jenkins (1992) cited in Lantolf, 1999, p. 880). Berger and Luckmann make a similar proposal that the social identity that a child develops is dependent on the filtering of their social world by those around them (1966). The

significant others (usually close family members) to the child determine how the child places themselves in the world. “Thus the lower-class child not only absorbs a lower-class perspective on the social world, he absorbs it in the idiosyncratic coloration given it by his parents” (1966, p. 151). This socialisation process is highly dependent not only on cognitive learning, but also on the emotional attachment that the child has towards their significant others. This highly charged emotional element leads to a level of resistance to challenges to this primary socialisation.

Reay *et al.* (2005) referred to the institutional habitus as a way to explore the relationships between the type of school attended by young people in the UK and their choice of HEI. They use the same concept for habitus that Bourdieu applies to individuals, but use it to describe the individual institutions and their “‘school effect’...[as] an intervening variable, providing a semi-autonomous means by which class, raced and gendered processes are played out in the lives of students and their higher education choices” (Reay *et al.*, 2005, p. 35). In their study of six institutions preparing young people for higher education, they found that many of the choices of young people were rarely rational or calculated, indicating the unconscious dispositions predicted by Bourdieu’s theories and they propose that while there will be effects from family and peer group as well, there are clear effects on the individual’s choices of higher education based on the habitus of the school or college they attend.

Adjusting to the Dominant Culture in Higher Education

It may be that some of the differences in socioeconomic group representation in the UK Higher Education system are due to differing cultural attitudes inculcated by habitus towards education. As described earlier, Bourdieu’s model of education reproducing the social class system may explain why children from lower social classes do not reap the same benefit from compulsory education as children from higher social classes. At this stage of education the children have no choice about

participating, but once past the age of compulsory education, other aspects of cultural alienation may be apparent in the choices made about whether or not to participate.

For students from lower socioeconomic backgrounds, the culture that they experience as they grow up is formative in respect of their identity, language and conceptual processes. The education that they experience is largely directed at the middle classes and values middle class culture and language rather than the one with which they are familiar (Archer, 2007). Consequently when lower socioeconomic class students enter university, they do not have the cultural capital that middle class students have and are likely to develop a different learner identity compared to students from more advantaged backgrounds (Marshall, 2013). These identity differences are likely to produce a level of 'culture shock' when an individual moves into a different cultural arena, for example, a student coming to higher education from a family and school with no tradition of higher education. There will then be a process of acculturation which has a set of stages through which an individual passes, and if students are to be retained, it may be important to offer explicit support to enable acculturation into higher education (Marshall, 2013).

Habitus leads to different expectations and motivations

In a 2005 UK study of participation in Higher Education, Gorard and Selwyn demonstrated that of all the variables they considered, the most influential was parental background. They described this situation as one "where individuals create, for themselves and through their early experiences a 'learner identity' inimical to further study, then the prospect of learning can become a burden rather than an investment for them" (2005, p. 1193).

For the traditional student, the move to university is likely to be seen, by themselves and their families as a natural next step after compulsory education, whereas

students from lower socioeconomic backgrounds may be stepping outside of the expectations held for them by their families and that they hold about themselves by going to university. This can be seen as a form of secondary socialisation. Berger and Luckman describe secondary socialisation as “the internalization of institutional or institution-based ‘sub-worlds’” (1966, p. 158). In secondary socialisation, the learning sequences are important in establishing the knowledge that must be acquired to access the new sub-world, although the stipulations of the level of knowledge required may be a further function of the elite setting barriers for those outside their class, rather than a pragmatic approach to the level actually required.

In a qualitative study of undergraduates at elite universities, Macrae and Maguire (2003) report on two students from Widening Participation backgrounds and contrast them with two students from a traditional student background. They report that the motivations may be different, with one Widening Participation student stating that the motivation for study is to increase chances of securing a well-paid job, whereas the two traditional students cite access to elite groups and networks as a motivational factor. Without the understanding and knowledge about university life before they start, the non-traditional students find themselves isolated and are sometimes trying to negotiate two different sets of social expectations. The authors describe them as “perhaps in, but not of, the university” (2003, p. 38), whereas traditional students have a seamless transition along the educational pathway.

‘I really hadn’t a clue what was involved in going to university... Nobody told me, nobody knew and I never knew what to ask... and nobody I knew knew much because people at my school don’t go to university.’

(Macrae & Maguire, 2003, p. 38)

The Process of Acculturation

The process of cross-cultural adaptation is dynamic and stressful and can be seen as a cycle of experiencing new situations which the student finds stressful, leading to a withdrawal from the process and then a readjustment to adapt to the new situation. This can be a difficult process and it is recognised as such by Kim who says that “to acquire the necessary communication competence of the host society means going through many stressful emotional ‘lows’” (1988, p. 55). Berger and Luckman (1966) observe that there is usually some resistance to challenges to the internalisation of socialisation and that the resistance is much greater in respect of primary socialisation than secondary and that secondary socialisation may occur several times. In his paper on cross-cultural adaptation, Kim (1988) recognises that personality attributes and preparedness for change will affect the rate of adaptation to a new culture, and Byram notes some of the attributes likely to support successful acculturation (the process of adapting to a new culture):

Attitudes which are the precondition for successful intercultural interaction need not simply be positive, but to be attitudes of curiosity and openness, of readiness to suspend disbelief and judgement with respect to others’ meanings, beliefs and behaviours. There also needs to be a willingness to suspend disbelief in one’s own meanings and behaviours, and to analyse them from the viewpoint of the others with whom one is engaging.

(Byram, 1996, pp. 20-21)

The difficulties inherent in acculturation mean that students often need support to help them adjust. Berger and Luckman (1966) recognise that significant others to an individual are important in maintenance of subjective reality and many students find that the support of their family is vital to success. In a study of non-traditional students at university Bowl (2003) found that very few of the participants had family

members with university experience and they found it difficult to access peer support at the university because family commitments reduced the amount of time they could spend in informal support situations.

According to Cushner (1994a), the issue of belonging is an important concept. When excluded, individuals experience feelings of loneliness, alienation, loss of self-esteem and a decreased sense of direction and purpose become apparent. If students are to be in a position to gain the most from their educational experiences, they need to feel engaged and included in the process. It is important the teachers are aware of the impact of verbal and non-verbal forms of communication and that there are different styles based on gender, culture etc. (Cushner, 1994b).

2.5.4 Rational Decision or Unconscious Action

Adult education does not choose its students, they choose (or do not choose) adult education

(Benn, 1997, p. 34)

As described earlier, when Bourdieu considered the effect of habitus on an individual's actions, he argued that the internalisation of ideas about a person's chances of success meant that many of the decisions about engagement with higher education are taken unconsciously, in an unexamined process of taking the route expected by an individual based on their habitus. An alternative argument, however, is that this concern with underrepresentation is actually the middle class patronising the lower socioeconomic classes and that the lower socioeconomic classes are making informed choices about whether to participate or not. Crowther (2000) argues that it is resistance to participation, not barriers which leads to underrepresentation and that non-participation is a matter of choice.

Hall and Donaldson (1997) considered factors such as parents' education, economic status and early pregnancy in a study of non-participation in adult education in women who had not completed high school education, and found that an important aspect was lack of voice - "At the heart of non-participation lies a 'deterrent' so deeply embedded in some women that no theory can fully capture its meaning. The way a woman feels about herself, her self-esteem and self-confidence, and the way she can express herself are significant elements in her decision about whether to participate in adult education" (Hall & Donaldson, 1997, p. 98). Rubenson (1989) found that those who value middle class values are most likely to participate and argued that having an adult education system based on middle class values and contexts was more likely to widen the educational and cultural gaps in society.

2.5.5 The Effect of Fees and Finance

Ultimately students may be making the choice not to attend university because the financial implications provide too much of a barrier and there is speculation that, not only do students from lower socioeconomic groups choose not to go to university because of a fear of debt, but that the new fees regime introduced in 2012 will further reduce participation by disadvantaged students (Callender & Jackson, 2005); "financial security makes adults more likely to take productive risks, such as undergoing training...that enhance capabilities. Inequality thus remains self-perpetuating to some extent; it is harder to escape poverty having grown up in it" (Hinton-Smith, 2012, p. 5). There is also a regional imbalance in HE participation which may be exacerbated by the regional variation in debt aversion (Bachan, 2013). There are large differences between the participation rates of English regions, for example, young people living in London are 50% more likely to enter higher education than those in the North East. Given that the government estimates that a graduate earns around £100,000 additional net income over a lifetime compared with a non-graduate, it is likely that economic disparities between regions are going to

grow, maintaining the regional disparities in respect of the financial barriers to Higher Education (PAC, 2009).

The pattern of recruitment of mature students has been similar to that observed with the participation of lower socioeconomic groups, that the introduction of fees has seen a decline in applications by 15-20% (Milburn, 2012). There is recognition that widening participation groups and especially adult learners are the most likely to experience financial concerns as a significant barrier (Pollard, 2008). Such groups are often geographically grounded, due to family and financial responsibilities (Pollard, 2008) and therefore less able to relocate in order to access institutions with lower course fees.

In England the responsibility for student financing has gradually transferred from the Government to the student, starting with a move from grants to loans and then the inclusion of top-up fees. The current fee-structure is based on government loans which do not need to be paid back until the student is earning and, presumably, benefiting from the graduate premium. This lack of up-front fees should mean that no-one will be unable to access Higher Education on the grounds of insufficient finances. Yet commentators on widening participation consider that the introduction of higher fees to students has “impacted damagingly on Higher Education participation amongst the most vulnerable students” (Hinton-Smith, 2012, p. 5). The recent global recession has deepened cuts to education, and with UK Higher Education Institutions expecting 80% spending cuts the majority introduced fees at or near the £9,000 maximum in the academic year 2012/13 (HEFCE, 2010). The effect of fees at the previous level of around £3,000 has been noted in increased rates of applications to the Open University from traditional-age students; increases in applications to international universities; and evidence of student waiting until 21 before commencing university so that they are assessed on their own financial

income rather than their parents' (Hinton-Smith, 2012). The increase of fees to £9,000 is likely to produce more changes in student behaviour. Over the last few years demand has outstripped supply for Higher Education places, and perhaps the increase in fees will redress the balance by deterring poorer students.

There have been further financial cuts which may affect students from disadvantaged backgrounds. Aimhigher, a national programme to widen participation to Higher Education in England, was disbanded in July 2011 and its replacement by the National Scholarship Programme does not provide financial support for outreach work; universities are expected to fund their own outreach work from the £9,000 fees and any student support is for the first year only (HEFCE, 2010). The Educational Maintenance Allowance (EMA) provided support for 16-18 education for students from disadvantaged backgrounds - predominantly Black and Minority Ethnic and single parent families, and was credited with being an important factor in increasing social mobility providing support (Milburn, 2012). There was evidence that it improved retention and achievement at 16-18 with 30% of students indicating that without the EMA they would have left education. The EMA has been removed in England in 2010. The evidence on bursaries and fee waivers for university students is more mixed, however, and does not seem to show any change in behaviour of student choice (Corver, 2010). Perhaps the mechanism is more subtle and related to self-efficacy beliefs; the message may be that selective universities do not have students from lower socioeconomic backgrounds because they are not welcome and the introduction of higher fees is reinforcing the message that this is not a place where disadvantaged students are welcome.

2.5.6 Underrepresentation is a Complex Mix of Reasons

While it is interesting to consider the relative merits of the three outlined factors which may be responsible for underrepresentation; poor initial education, recruitment practices; or alienation from the dominant culture, it is likely that the real picture will

be a complex mix of all of them in addition to other factors. Bourdieu recognised that there were other factors involved in the representation of different groups in education pointing out that “elimination or survival in the system are not randomly distributed amongst individuals of the same class, but are themselves liable to be linked to social or cultural criteria differentiating sub-groups within a class” (Bourdieu & Passeron, 1990, p. 104).

In order to explore this mix of factors affecting engagement in Higher Education, Gorard and Selwyn (2005) conducted a set of interviews with adults in the UK which described their lifelong learning participation and investigated the patterns of behaviour with regard to engagement with post-compulsory education. What was interesting about this study was that it involved home-based interviews in four different electoral wards in England and Wales using systematic sampling to be representative of economic activity, education attainment levels, age and sex, rather than data collected from individuals already engaged in lifelong learning. Consequently the data can be used to consider the factors which affect non-participation in post-compulsory education. Although the study reports data collected on 1,000 respondents, they claim to have collated similar evidence from 10,000 adults. The outcome showed that the “key social determinants predicting lifelong participation in learning are time, place, sex, family and initial schooling” (Gorard & Selwyn, 2005, p. 1211).

There seem to be cultural attitudes to an individual’s identity as a learner which are affected by the era in which they grew up, their local environment while growing up e.g. how economically advantaged the area was, their initial experience of schooling e.g. how successful it was, and most strongly their parents’ social class and educational experience. These factors are likely to affect how relevant an individual considers continuing education to their own situation e.g. if there are few

occupational opportunities why would an individual use resources to train for non-existent jobs; if their first experience of education was a failure, then why would they consider setting themselves up to fail again; if no-one else in their family continued education beyond school-age why should they be different. Gorard and Selwyn argue that these data show that it is possible to predict, at the end of an individual's compulsory schooling, their engagement in lifelong learning. They note that although changes to the school-leaving age has meant that over time individuals are leaving school with a longer education and higher levels of qualification, the attitudes to education set by the factors described are retained in each cohort. They subsequently argue that the recent focus on the 14-19 agenda will therefore not change the patterns of participation in lifelong learning; rather, conversely, it has reduced the level of formal adult participation in learning and made it less evenly distributed among different social groups.

It could be argued that if Bourdieu's concepts of capital, habitus and field are correct, then there will be little value in changing the practice of Higher Education Institutions in order to improve social mobility, as the habitus of non-traditional students will prevent them from succeeding. Indeed it is this aspect of determinism (Alexander, 1995; Jenkins, 1992) in Reay 2004 which provides much of the criticism of Bourdieu's concept of habitus. However, Bourdieu (1999) also points to the ways in which individuals do strive against current circumstances and postulates that it is when an individual finds themselves in a field which is new to their habitus that the resulting tension produced can generate change and transformation (in Reay 2004). As Reay (2004) describes it, it is possible to observe "myriad adaptations, responses, reactions and resistances to 'the way the world is', ...[and] also of individuals struggling to make the world a different place" (2004, p. 437). Reay also makes the important distinction between the unconscious actions engendered by habitus and

the conscious decisions to take different action following reflection and self-questioning.

2.6 Employment Prospects Following a Higher Education

For many students the ultimate purpose of Higher Education is improved employment prospects and yet, despite the social mobility agenda, there seems to be evidence that it is becoming more difficult for people from lower socioeconomic backgrounds to access professional careers (Milburn, 2009). There is relatively little research into patterns of graduate employment in the UK and what there is seems to be contradictory, with some maintaining that the graduate advantage in the work force is still present (Purcell, Elias, & Wilton, 2004) and others arguing that there are not enough jobs for the increase in graduates (Brown & Hesketh, 2004). The research does seem to show that not all graduates are equally positioned to compete for the jobs that are available (Purcell, Wilton, & Elias, 2007).

Milburn's report (2009) states that many professional jobs

...now require at least an undergraduate degree...employers said they found it increasingly hard to fill graduate vacancies because students fail to match academic achievement with leadership, team working and communication skills...There is good evidence that young people develop these skills through extra-curricular activity and participation in clubs and societies.

(p. 44)

It is important that students engage fully with university life, as engagement with extracurricular activity has a large impact on subsequent employability. Stuart, Lido and Morgan (2012) conducted a study of extracurricular activities of students at different universities and from different socioeconomic backgrounds. They found that there were marked differences in the choices of social activities dependent on background and students from white middle-class backgrounds were more likely to engage in the types of activities e.g. sports, clubs and societies which would give them the opportunities for demonstrating leadership skills to future employers. Ironically, the students from working class backgrounds are less likely to engage in what is seen as “having fun” (2012, p. 139) as they feel the need to concentrate on achieving a good degree. They found that “employers valued and used graduates’ range of interests and activities as an important part of their selection process,” adding that for many employers “the class of degree was used as a minimum requirement of attainment” (2012, p. 130).

Most research on the employability of mature students, and particularly female mature students, tends to indicate that they are at a disadvantage in the labour market and that they consequently experience less added-value from a degree than traditional age students (Egerton, 2000). What Woodfield (2012) considered, however, is that much of this research is based in the concept that only full-time work is considered successful employment, ignoring the fact that for mature women, part-time employment to complement care responsibilities may be highly desirable. When she analysed the employment status of two cohorts of graduates she found that, contrary to the current discourse of disadvantage, mature women were most likely to be employed in a graduate level role compared with the other three categories of either all men, all women or mature men. However, what is not clear, is whether this part-time work is at what would be considered graduate-level rates of pay or status.

2.7 Summary

This chapter has considered which groups are underrepresented in Higher Education and some of the possible reasons for this underrepresentation based on the theories of Bourdieu. The reasons have been grouped into three major factors; poor education resulting from lack of cultural capital, recruitment practices which reproduce a stratified society and alienation from the dominant culture caused by a dominated habitus; while acknowledging that individuals who do not access Higher Education will have their own combinations and versions of these reasons. Despite differing opinions as to the extent of the underrepresentation or the extent to which this is linked to social mobility, there does seem to be a recognition that the current system is not yet right for ensuring equality of opportunity for everyone. There is plenty of evidence to demonstrate that Bourdieu's theories of cultural capital and habitus leading to reproduction of a stratified society through the medium of education is applicable to the UK. While there is clearly work to be done during compulsory education to change attitudes to lifelong learning, it is important that the post-compulsory education system is welcoming of a more diverse student body i.e. that the recruitment messages are backed up with retention practices. There needs to be clear recognition of the difficulties faced by individuals striving to fight against habitus and ensure that educational systems support students in this process of reflection and self-questioning (Reay, 2004). Although there is disagreement as to the extent to which education can improve social mobility and the degree of underrepresentation of certain classes in Higher Education, there is agreement that there has been an increasing requirement for degree-level education to access many professions (Milburn 2010). For many careers, lack of a degree is a barrier. If widening participation initiatives in Higher Education are to be successful they need to address the problems of cultural capital, recruitment bias and learner alienation.

Unless there is genuine inclusion by recognition of, and meeting the needs of widening participation students, they are unlikely to be more than aberrations required by universities to fill government-led targets, remaining second-class students outside the dominant framework (Hinton-Smith, 2012).

CHAPTER 3: Overcoming the Barriers of Inadequate Education and Recruitment Bias: A Range of Initiatives to Widening Participation

Introduction

As outlined in Chapter 2, the evidence suggests that simply widening provision in Higher Education is not sufficient to widen participation and that there also needs to be attention given to the issues of inadequate initial education, recruitment practices and alienation of some learner groups. This chapter outlines some of the initiatives to widen participation which are either in use or may be considered for use in the UK. It is not meant to be a comprehensive analysis of widening participation in the UK, but rather a way of siting Foundation Programme activity in widening participation in general and the Durham Foundation Programme specifically in the UK Foundation Programme profile. As previously stated, much of the widening participation has focused on recruitment rather than ensuring that the students' experience is appropriate to their background. For example, the Office for Fair Access reported that the estimated spend on fair access initiatives by universities for 2013-14 was, on average, 26.5% of the extra fee income above the basic fee, with 18.8% focused on bursaries for students, 4.2% on outreach activities but only 3.5% on retention activities (OFFA, 2012).

The most common mechanism currently utilised by English universities to widen participation is to offer financial support in the form of bursaries or scholarships (OFFA, 2012). As noted previously, however, there is little evidence that bursaries alter students' behaviour with regard to choice of university (Corver, 2010). Other widening participation initiatives which address recruitment issues focus on outreach activities and admissions processes; the former to increase the numbers of applications from underrepresented groups and the latter to convert those applications to offers of places (Milburn, 2012; OFFA, 2012). Outreach activities

include those which raise aspirations, improve students' attainment while still in pre-University education, and increase awareness of Higher Education by the use of summer schools, school visits to university campuses and mentoring programmes. Changes to admissions processes are less widely employed, with some universities considering contextual data alongside qualifications e.g. the likelihood of students from a school to achieve good A level grades, and others diversifying admissions criteria (OFFA, 2012).

3.1 Does Widening Provision Lead to Widened Participation?

The extent to which widening participation in Higher Education will affect social mobility is dependent on the strength of the link between education and social mobility. The economic model proposed by Blanden *et al.* (2004) correlates declining social mobility rates with educational inequality, which has led to an emphasis on education as the major tool for overcoming the problem. Goldthorpe's (2013) alternative model, however, suggests that changes in educational policy will have little effect on either absolute or relative social mobility rates. Absolute social mobility rates have, in the past, been affected by changes in employment and, as a result, class structures, and Lucas's model of effectively maintained inequality indicates that advantaged parents will use economic resource to maintain the inequality (Lucas, 2001). This is not a new argument, Neelsen (1975) argued that social inequality is structurally determined and is likely to be maintained by class succession, institutional differentiation and devaluation of education, and that focussing on education as a means for change was unlikely to produce anything other than marginal improvements. Most researchers do accept the role of education in social mobility, for example, Boliver asserts that "mass participation in higher education is widely considered to be crucial not only in the continued international economic competitiveness of industrialized nations, but also to the

promotion of social justice and social mobility within modern societies.” (2011, p. 229). Increasing the number of places available in Higher Education is unlikely to be a simple solution to the issue of inequality of opportunity, however, as there will be other barriers preventing underrepresented groups accessing those places and subsequently accessing professions which confer wealth and status.

Boliver questions the assumption that higher education expansion alone can reduce socioeconomic inequalities (2011) i.e. that widening provision will lead to widened participation. This assumption arose out of modernisation theory which predicted that as industrialised nations required workers to be more educated, the expansion of education would lead to educational equalisation (Parsons & Platt, 1970; Treiman, 1970). Treiman argues that the free mass education systems more likely to be found in industrialised countries mean that in such situations the “opportunity to continue with schooling tends to depend mainly upon academic success at the previous level of schooling, rather than upon financial capability” (1970, p. 218). However, evidence indicated that this was not the case and that inequalities in the secondary educational system remained (Halsey, 1980). In order to explain this discrepancy, Raftery and Hout (1993) formulated the hypothesis of Maximally Maintained Inequality (MMI) which was later expanded on by Lucas (2001) to encompass Effectively Maintained Inequality (EMI). What these hypotheses contend is that when educational opportunities are expanded, it will be those from more socioeconomically advantaged backgrounds who will avail themselves of the opportunities, and only when the majority of young people from these groups are engaged with Higher Education will further expansion benefit those from less advantaged backgrounds.

Boliver (2011) conducted a study to test whether the predictions made by MMI and EMI were upheld in the empirical data for UK Higher Education. She tracked the increase in Higher Education participation by social class and found that between

1960 and 1995 there was an increase in probability of participation in HE for all classes, but that the relative likelihood of participation between Service class (Ns-SEC 1 and 2) and Working class remained about the same (change of 0.16 in probability for Service class to access Higher Education compared with 0.20 for Working class) whereas the greatest change was in the probability of someone from Intermediate class participating (change of 0.34). Boliver makes the point that this expansion for the intermediate class “occurred only after the enrolment rate for the service class had reached ‘saturation’ point” (2011, p. 238). Having considered the quantitative increases in participation in HE, Boliver then analysed the qualitative differences in whether students were enrolled on degree programmes and what type of institution they were enrolled at. The results showed that inequalities in enrolment in both degree programmes and at ‘Old’ Universities were maintained, demonstrating the same class inequalities as had been prevalent in 1960 i.e. those from the Service class were much more likely to be enrolled on degrees and be enrolled at an Old University than those from the Intermediate class and Working class. There is an even greater inequality when institution is considered; in 1960 the difference in probability of attending an ‘Old’ university from the Service class was about 0.18 greater than from the Working class; in 1995 that difference had increased to 0.25.

What these studies indicate is that more needs to be done to recruit underrepresented groups into Higher Education beyond simply making more places available. The rest of the chapter considers some of these recruitment practices.

3.2 Sutton Trust’s Range of Initiatives

In 2010 the Sutton Trust commissioned an analysis of various methods of widening participation outlined in Table 3.1. The initiatives were evaluated in terms of cost-benefit ratio by comparing the estimated cost of implementing the scheme with the

estimated increase in lifetimes earnings for those involved in the initiative. The report provides a comprehensive description of a wide-ranging set of mechanisms to widen participation which could be utilised in the UK.

Table 3.1 Summary of analysis – ranked by cost-benefit ratio Sutton Trust. (2010).

Policy	Pupils reached per cohort	Cost of policy per cohort	Total Benefits per cohort	Cost/Benefit Ratio
University access programmes linked to contextual Admissions	3,000	£4m	£212m	53:1
Summer schools at leading universities	3,000	£1.6m	£69m	43:1
No excuses / KIPP schools	6,000	£22m	£584m	27:1
University admissions test support	2,000	£0.8m	£21m	26:1
Teacher performance, development and incentives programme	68,000	£75m	£1,227m	16:1
Summer Camps for primary children	18,000	£69m	£910m	13:1
Teacher residencies	68,000	£92m	£1,227m	13:1
Independent careers and education advice service	560,000	£150m	£1,035m	7:1
Increased low income children at high performing state schools	5,000	£8m	£58m	7:1
Personalised performance data	730,000	£9m	£52m	6:1
Individual enrichment sessions for bright children in KS3	14,000	£105m	£474m	5:1
Comprehensive Early Years programme	90,000	£687m	£2,528m	4:1
Financial support for internships	13,000	£6m	£25m	4:1

Means-tested fees at independent schools	6,000	£110m	£365m	3:1
Extra-curricular programme to boost school engagement	1,000	£25m	£79m	3:1
Reduced class sizes	560,000	£5.2bn	NA	NA

N.B. all costs are in 2009 pounds.

All of the initiatives in the analysis were directed at improving initial education or improving the progression from initial education to university and as such would be directed at individuals who were currently in education – either still in school or at Sixth Form College or a Further Education College, i.e. a captive audience. Even if a large number of these initiatives were implemented immediately, there would still be a large number of non-traditional students who are currently outside the education system who would not benefit. A further consideration is that none of these initiatives address the issue of learner alienation in the university context. The Milburn Report (2012) indicates that the lack of focus on retention activities means that the rate of improvement in retention has been slow and the variation between different universities with regard to retention rates remains high and that some non-traditional student groups are more likely to drop-out of university. This means that non-traditional students are perceived to pose a risk to both the university they enrol with and the state which invests in them (Leathwood & O'Connell, 2003).

For non-traditional students who do not have the traditional A level qualifications to access university there are generally three routes into a degree-level education: The Open University, Access courses, or Foundation Programmes. A very small number of institutions are willing to take students without equivalent qualifications. For example, a study into widening participation explored whether lowering entry qualifications and accepting non-traditional entry qualifications would adversely influence the performance and progression statistics of institutions by considering

student outcomes. The results concluded that neither performance nor progression were affected by entry qualifications once other factors such as module load and the subject taken by the student was allowed for. They found that, on the whole, students taking Business or Social Science degrees tended to do less well in terms of performance but that this was less marked in students with vocational or no formal qualifications, who were mature and had relevant work experience (Houston, Knox, & Rimmer, 2007). This is an unusual model however, and most institutions expect students to do some preparation for university level study.

3.3 Routes to Higher Education for those without Traditional Qualifications

3.3.1 The Open University

Woodley (2012) analysed the role of the Open University on widening participation in the UK as its stated aim when it began delivering Higher Education in 1971 was to be “open as to people” (2012, p. 51) meaning that the aim was to make a university education available to all people. It was distinctive in that it required no entry qualifications, in that it delivered its programmes at a distance on a part-time basis so that students could continue to work and live at home, and for its credit-based system which allowed a flexible approach to learning. On its inception, the Open University only had around 25% of women enrolments, but this has steadily increased to just over 60% in 2009, however this is against a background of a general increase in female participation in Higher Education, with little or no special case being argued for the Open University as particularly championing women’s participation (Woodley & Wilson, 2002). In fact, as previously discussed in Chapter 2, there is a good argument to be made for considering men the underrepresented group (Gorard, 2008).

The Open University originally targeted mature students, setting a lower age limit of 21 for enrolment, which has since been removed, and the median age for Open University students has been consistently around early 30s. Although the median age has remained constant, this does not reflect the changing pattern of student age in the Open University - in the last 10 years the proportion of enrolments for students in the age group 30-39 has been decreasing. At the same time the number of enrolments from students under the age of 25 has been increasing, so that in 2009 nearly 25% of enrolments were from students aged under 25 (Woodley, 2012).

As with gender, the rates of Black and Minority Ethnic students have increased in the Open University, but this is against a backdrop of general increases in Higher Education participation in this group. The data does not show that students with disabilities are more likely to engage with the Open University rather than standard institutions, with a much greater percentage (about 8.5%) of new enrolments in full-time Higher Education being students with disabilities than in the Open University (just under 4%) The raw data does not give a picture of the range and effect of disabilities on students' ability to engage with Higher Education, however, and there may be a qualitative difference in the types of disabilities experienced by Open University students compared with other Higher Education Institutions (Woodley, 2012).

The Open University does not require students to have previous qualifications and consequently a large proportion of the students do not possess qualifications which would normally gain them access to Higher Education. This is balanced, however, by the fact there is a much larger proportion of students with previous Higher Education experience. Consequently when trying to measure how successful the Open University is at widening participation, Woodley describes the situation as "rather confusing" (2012, p. 59). Where the Open University is clearly having an

effect on widening participation is in improving the representation in Higher Education of people from lower social classes; Woodley cites that of those students who declared parental background 50% were described as working class (2012).

3.3.2 Access to Higher Education Diploma

Access to HE programmes are specifically designed for those without traditional qualifications as a preparation for Higher Education (QAA, 2013) and are usually offered by Further Education Colleges. They are characterised as being focused on vocational degrees and consequently are more likely to provide routes to non-elite universities than other forms of university preparation. This is particularly true for female students accessing nursing, social work etc. which have “low pay, low status, long hours and high-stress feminised caring work that also dominates the same individuals’ lives at home, as they bring up children, ultimately falling short of providing individuals with opportunities to move beyond the constraints of such traditional stereotypes” (Jackson, 2004 in (Hinton-Smith, 2012, p. 11). There is research which shows that universities report higher retention rates with A level students when compared with Access students and consequently elite universities are reluctant to offer places to Access students, preferring to fill their places with those students who are more likely to complete (Hinton-Smith, 2012).

There also appears to be issues with Access students’ approaches to studying. Richardson (1994a, 1994d, 1994e, 1995b) conducted a series of studies into the approaches to studying adopted by mature students and although the results showed that mature students developed desirable study methods, one aspect of the study indicated that mature students on Access courses were less likely to adopt desirable approaches to studying than other mature students (Hayes, King, & Richardson, 1997). As the authors recognise, the study does not prove causation, however, they suggest that the distinctive approach to education embodied in Access courses may be “inculcating attitudes, approaches and orientations to studying which are

inconsistent with those of the majority of students in higher education” (1997, p. 28). They report that many Access students either do not progress to Higher Education, or withdraw early in the course and they suggest that the cultural differences may provide a partial explanation. Chapter 5 of this thesis explores ideas around communities of practice and it may be that the community of practice in Further Education Colleges which are the major providers of Access courses may be promoting different practices than those prized in the Higher Education community of practice.

Osborne, Leopold and Ferrie (1997) conducted a study comparing the performance of students with traditional and non-traditional qualifications admitted to the University of Stirling. They found that of all non-school entrants, BTEC students performed consistently below average and that Access students studying Maths and Science were more likely to perform less well than other Access students. They found, however, that students entering from the University's own Access course performed only slightly lower than students entering with GCE A levels and concluded that “the more influence and control the University has over Access courses, the better students will perform subsequently, but that FE entrants performed less well than HE based Access students, even where the University had some control over the courses through a linked college scheme” (1997, p. 171). This may also indicate the effect of different communities of practice.

Other Vocation Provision in Further Education: Foundation Degrees

It is important to note the difference between Foundation Degrees and Foundation Programmes. Foundation Degrees are distinct from Year 0 Foundation Programmes as they are vocational qualifications designed for students who are working in the area in which they wish to gain their qualification and who take the first two years of their degree with a Further Education institution. They can then complete their degree by taking a further two years at a Higher Education Institution.

David (2012) described a study investigating Higher Education in Further Education collaborations and whether these initiatives lead to a seamless system of tertiary education. The study showed, however, that “institutions, staff and students treat Further Education and Higher Education as separate enterprises, affecting the practices of students and tutors at various stages in the student lifecycle and the imagined futures at the end of college study” (p. 25). This may well reflect the different communities of practice found in the different types of institutions. Certainly a study to explore the transition from Vocational Education and Training showed that students entering Higher Education with vocational qualifications were less likely to gain a place and to keep it beyond their first year (David, 2012).

3.3.3 Foundation Programmes

The desire for control over pre-degree courses has led to a number of universities developing their own Foundation Programmes to provide an alternative to the Access model. A further incentive was provided by the increasing competition for student numbers, by new universities in particular, and some institutions started becoming dependent on recruiting widening participation students, often with lower entry qualifications and requiring greater educational support. Retention rates for such students were lower due to social issues related to lack of cultural capital and practical factors such as the need to take paid work (Ainley, 2002). During this reversal in numbers, in the mid to late 1990's, universities began to develop Foundation Programmes as a mechanism to prepare such students for university.

Outline of a Study to Compare Foundation Programmes in the UK

There appears to be very little clarity about the scope and nature of Foundation level provision within the UK, and there appear to be very few studies of this relatively new type of provision. In order to produce a national picture of Foundation provision, in July 2011 Durham University's Foundation Centre commissioned Marketwise to conduct a review of the data available to the public on Foundation courses, from the

websites of 127 universities throughout the UK. Foundation provision for both Home and European Union students, and Overseas status students were assessed. The main data sources were the websites produced by the Higher Education Institutions, with each provider being researched for both Home and European Union, and Overseas provision. The sample included universities that based Foundation Years in-house, and those provided in partnership with further education colleges.

Of the 127 universities analysed, 76 institutions offered some form of Foundation Year programme for Home and European Union students. The 76 institutions offering a Home and European Union student Foundation Year included representation from each university affiliation group: Russell Group, 1994 Group, Million+, University Alliance, and institutions which were unaffiliated, Table 3.2 (Marketwise Strategies, 2011).

Table 3.2: Foundation Year Provision by University Group (Marketwise, 2011)

Affiliation	Number of universities by affiliation offering Foundation Programmes	Number of universities in affiliation group	Percentage of universities offering Foundation Programmes by affiliation group (%)
Russell Group	10	20	50
1994 Group	12	18	67
Million+	19	27	70
University Alliance	18	23	78
Unaffiliated	17	39	45

In order to explore the data provided in the report, the information was further analysed with respect to the university rankings and the analysis is shown in Table 3.3 below. To calculate the relative positions in the rankings, three different rankings were used for the year 2010, the *Times*, the *Complete University Guide* and the *Guardian*. An average of these rankings was used to place universities in the first

quartile (top 25% of rankings) through to the bottom quartile (lowest 25% of rankings). There is a clear difference between the upper quartile and the rest of the institutions in terms of whether they provide a home Foundation Programme, whereas there is no difference in the percentages of institutions providing International Foundation Programmes for comparison.

Table 3.3 Use of Foundation Programmes by Universities by ranking (Marshall & Leech, 2011)

Quartile in rankings	Total	% with Home Foundation	% with International Foundation
Q1 – upper	26	46.2 (n=12)	84.6 (n=22)
Q2 – second	29	75.9 (n=22)	93.1 (n=27)
Q3 - third	30	60.0 (n=18)	80.0 (n=24)
Q4 - lowest	26	73.1 (n=19)	92.3 (n=24)

Top ranking universities usually have selecting departments, which means that they have a greater number of suitable applicants for each place available, whereas universities further down the rankings are more likely to be recruiting institutions i.e. they have to work to attract student to ensure that quotas are met. There are likely to be two different motivations for developing Foundation Programmes: for some recruiting universities Foundation Programmes enable them to take students who were intending to go to university, but who have not achieved high enough A level grades, that is, deepening participation; for selecting universities the purpose is more likely to be to increase the diversity of student applicants, by including those who have not taken the A level route and consequently widen participation.

The vast majority of programmes offered provided pathways to degrees in Sciences, Engineering, Computing, Art and Design or Medicine, with only a very small number of institutions offering Foundation Programme courses in Social Sciences or Humanities as shown in Table 3.4.

Table 3.4: Availability of Foundation Year by academic discipline (Marketwise, 2011)

Academic Discipline Pathway	Number of Institutions offering type of Pathway
Engineering & Technology	52
Sciences & Mathematics	49
Computing	22
Art & Design	21
Humanities & Social Sciences	12
Business & Management	9
Medicine	8
Sport Sciences	6
Law	5

The range of routes was generally quite limited, with the majority (61) of institutions offering five or fewer individual Foundation Year programmes/routes, and only four institutions offering more than ten individual Foundation Year programmes/routes.

Entry requirements for Foundation Year programmes were extremely diverse for those aged under 21, although most institutions specified both a minimum and maximum points score required to apply for Foundation Programme. Mature entrants, that is, those over the age of 21, were rarely required to have formal Level 3 qualifications i.e. A level equivalent, although it was usually expected that there would be evidence of prior exposure to the academic subject in question, for

example, gained through previous employment, and good standards of literacy and numeracy were also expected.

Modelling the Different Foundation Programmes

In order to capture the variation of Foundation Year Programme delivery nationally, I analysed the data provided by Marketwise to group programmes into models based on two important areas of variation.

1. Entry requirements: The primary modelling criterion was the entry requirements for each Foundation Year Programme. This criterion also provided information on whether mature students were encouraged to apply. A programme which only specified UCAS tariff points as an entry requirement without reference to mature student entry was deemed to be focusing on attracting students with recent A level study, i.e. deepening participation. Where mature students were mentioned as not requiring the same UCAS tariff points as under 21s, the implication is that the programme mixes mature students with those with recent A level study. No requirement for UCAS tariff points indicates a focus on widening participation beyond students with recent A level study.

2. Structural locus of delivery: The secondary modelling criterion is the structural locus of delivery, that is, whether the Foundation Year Programme is delivered in academic departments, Further Education Colleges or a specialist Centre. In turn this provides insight into student experience. For students in academic departments, the student support may be generic, that is, the same as Year 1 students, whereas students in a specialist Centre are likely to receive tailored support, and those in an FE setting may receive student support from either the FE College or the university generic systems.

The model therefore provides 12 potential combinations which are identified in Table 3.5. Of the 12 possible combinations 11 were found to be in use.

Table 3.5: Matrix of modelled delivery combinations (number of Foundation Year Programmes using each combination) (Marshall & Leech, 2011)

		Entry Requirements		
		UCAS points required for all age groups	UCAS points required for <21, but not >21	No UCAS points required
Where taught	Academic Departments	Model 1 (n=21)	Model 2 (n=20)	Model 3 (n=10)
	Specialist Centre	Model 4 (n=2)	Model 5 (n=0)	Model 6 (n=6)
	Academic Department and FE College	Model 7 (n=2)	Model 8 (n=6)	Model 9 (n=2)
	FE College	Model 10 (n=1)	Model 11 (n=3)	Model 12 (n=3)

The Foundation Programme at Durham University is a category 6 model, where there is no A Level grade profile or UCAS points entry requirement and students are taught in a specific Centre. This model is used by 6 institutions and 5 of them deliver courses with wide-ranging progression routes. Durham is the only English institution which uses this model, with four institutions based in Scotland and one in Wales.

This model is focused on widening participation to students who have not recently studied at A level, addressing the issue of inadequate initial education and recruitment processes. The Centre-based approach allows for tailored support to help overcome issues of alienation.

Summary

The work of the Office for Fair Access has led to a range of recruitment initiatives, frequently based on bursaries or fee waivers, to increase the proportions of non-traditional students in Universities. Evidence indicates, however, that students may need more than purely financial support to access university and certainly those who do not have appropriate qualifications will need to make use of alternative routes. It is important to have a range of initiatives as the issue is complex and there will not be a single solution for the wide range of non-traditional students. In terms of provision for non-traditional mature students Foundation Programmes can offer routes that overcome recruitment bias, allow for inadequate initial education and can also address issues of alienation. Within the Foundation Programme provision, the Durham Foundation Centre is quite unique in that it offers routes to all departments in the University, delivers the year 0 teaching in a central unit with dedicated teaching staff and does not require any formal qualifications for entry.

CHAPTER 4: Overcoming the Barrier of Alienation

Introduction

The previous chapter considered widening participation activities which focus on increasing enrolments from non-traditional students in terms of addressing inadequate initial education and recruitment practices. This chapter will consider the issue of alienation of some learner groups and explores some of the practices which may help retention of non-traditional students. As outlined in Chapter 2, if the dominant culture in Higher Education has been constructed around the 'traditional student' being white, middle-class and male, 'non-traditional students' may feel alienation when they enter the Higher Education community. In order to explore methods of overcoming alienation, this chapter considers different aspects of developing an inclusive education.

A study by Hockings, Cook and Bowl showed that non-traditional students want "to be recognised and respected as people with something to offer," (2007, p. 721) yet in some settings, students from lower socio-economic backgrounds often feel alienated by the middle class culture which predominates, particularly in elite universities. Cushner agrees that sociocultural inclusion is important in successfully teaching a diverse group of students and makes suggestions on how to achieve this. The curriculum should be inclusive and "focus on all students and integrate the contributions of many different people and groups to the history and experiences of a nation and the world" (1994a, p. 121). A wide range of teaching strategies should be employed and methods of assessment should be varied. "Portfolio assessment, for instance, is proving to be an effective means of gathering a wide range of evaluative information on students" (Hockings *et al.*, 2007, p. 722). The dominant teaching style in higher education, however, is the lecture, particularly as student numbers have increased, and the dominant assessment method is by examination (Hockings *et al.*, 2007).

Although the term 'non-traditional' comprises a wide range of students, as Egerton notes, most groups of non-traditional students e.g. ethnic minorities, lower socioeconomic classes, are commonly also mature students because they access Higher Education later in life (2000). Consequently the lessons learned from adult education are a valuable starting point for developing a pedagogy for non-traditional learners. A brief outline of adult education is followed by an exploration of the extent to which self-efficacy beliefs in mature learners might affect teaching approaches and how this might be related to personality traits such as conscientiousness and approaches to studying.

4.1 Lessons from Adult Education

Adult education is a large and amorphous field of practice, with no neat boundaries such as age in the case of elementary and secondary education, or mission, as in higher education. Adult education with its myriad content areas, delivery systems, goals and learners defies simple categorisation.

(Merriam, Caffarella, & Baumgartner, 2007, p. 53)

Over the last century the definitions and reasons for adult education have undergone several metamorphoses leading, in the latter part of the last century, to the concept of Lifelong Learning. The idea that people are learning all their lives has opened up what can be defined as adult learning with some commentators including formal and non-formal learning, assisted and unassisted learning, and learning which uses direct or indirect processes. The outcomes can also be varied from achieving qualifications, through acquisition of new skills, to simply having fun. Given this wide range of activities it will be helpful to define more clearly what is meant by adult education in this thesis and it is important to note that while it can be said that

individuals are learning all the time, they are not being educated all the time.

Wiltshire (1979) describes education as the “planned processes of learning undertaken by intent” (in Rogers & Horrocks, 2010, p. 52).

At one end of the spectrum of what is considered adult education is the idea that it encompasses the education of anyone over a certain age, regardless of topic. Clearly the definition of an adult being over 18 is inadequate for the purposes of creating a distinction between what is meant by adult education and standard education. The majority of people learning in an undergraduate course are over 18 and legally adult, but it is accepted that for the majority of these students their learning is a continuation of initial education rather than a return to education that is implied by the term adult education. At the other end of the spectrum is a much narrower definition that adult education is life-related and is limited to those topics which are only accessible as adults because they rely on experience, for example interpersonal relationships, politics and spirituality (Rogers & Horrocks, 2010).

The characteristics of adulthood have been explored by humanist educators such as Houle and Rogers and there are three main ideas that arise; maturity, perspective and autonomy (Rogers & Horrocks, 2010). Maturity in this context refers not just to physically reaching one’s full growth, but to the idea of full utilisation of one’s talents. Perspective refers to having a reflective capability to recognise one’s level of importance in society. Autonomy acknowledges the concept of taking responsibility for at least one’s self. Obviously many adults also take responsibility for others, but all adults are expected to take responsibility for their own actions and behaviours. Considerations of how adult education may differ from teaching children is a relatively new concept in the history of education, as, until recently, education was seen as something that only happened to children.

Most commentators agree that there are two clear differences between adult and child education, the first is that nearly all adult learners are voluntary learners and the second is that adult learners usually have an aim to achieve some learning outcome. Consequently, adults have the option to stop attending if they feel that their aims are not being met, whereas children in compulsory education are a captive audience and do not have that option. This leads to what Rogers and Horrocks (2010) refer to as the key determinant in defining the difference between adult education and teaching children which is the different power relationships between teachers and adult students, and teachers and children. The hierarchical relationships between children in school and their teachers is different when compared with the more horizontal structures found in adult education. This is mirrored in the terminology; adult educators frequently use the term facilitator rather than teacher, they often explicitly state that the students have as much to teach as to learn and it is usually made explicit that the students have control over their own learning.

4.2 Self-Efficacy

Recognising that as a learner one has responsibility for learning can be a source of anxiety for some students, leading to issues of low self-efficacy with regard to academic endeavours. Self-efficacy is the belief that one can do something and was developed as a concept by Bandura (1977) as the belief that one can master a situation and produce positive outcomes. It forms a major component of social learning theory which Bandura describes as the combination of behaviourism and cognition to bring about learning. As a concept it is quite distinct from self-esteem and self-worth, as it is an estimate of how well one may achieve a specific task, but not a measure of how one feels about one's self doing it. Consequently, an individual may be confident of achieving a goal that they do not value. Self-efficacy levels are important for the learning strategies that adults employ. According to

Semmar (2006) adults with high self-efficacy beliefs are more likely to adopt deeper and more successful learning approaches than those with lower self-efficacy who are more likely to take a more surface-level approach, have difficulty managing time and utilise less efficacious learning approaches. Self-efficacy affects motivation, achievement, effort and attitude to learning. Studies have shown that students with high self-efficacy beliefs “participate more readily, work harder and persist longer” (Zimmerman, 1995, p. 204) and studies have shown that raising self-efficacy beliefs lead to improved performance (Bandura, 1997).

As well as being a predictor of performance, self-efficacy can also predict the speed at which an individual will perform a task and the level of energy they will expend on it. There is a relationship between motivation to take on and persist with challenging tasks, and high self-efficacy (Schunk & Zimmerman, 1997). Studies by Lent, Brown and Larkin in 1984 (in Zimmerman, 1995) showed that in undergraduate students in a US college self-efficacy was a predictor of persistence in a science major.

4.2.1 Four aspects of self-efficacy

Bandura (1997) believed that there are four factors that affect development of self-efficacy beliefs: performance accomplishments (later referred to as mastery experiences), vicarious experiences, verbal persuasion and emotional arousal.

Mastery experiences are those that develop a set of successful outcomes in a range of contexts; vicarious experiences refers to the way people learn through observing the behaviours of others; verbal persuasion is a social process that involves messages from significant others about an individual's capabilities; and emotional arousal is concerned with an individual's physiological state and includes adverse reactions such as stress. Of these factors, Bandura (1997) considers mastery experiences to be the most influential in terms of self-efficacy development, as it provides real evidence of an individual's capability. Consequently if an educator is looking to support students' development of high self-efficacy levels, it will be

important to provide achievable short-term goals, teach specific strategies to improve and provide feedback on how well students are doing (Pintrich & Schunk, 1996).

4.2.2 A Study of Self-efficacy in Mature, Non-Traditional Students

It is to be expected that a good proportion of adult learners will have low self-efficacy with regard to academic work, as their time in school may have given them poor mastery experiences (Knowles, 1996). This is particularly likely for students coming from lower socio-economic backgrounds who did not have the cultural capital to be able to access an education system that awarded social ability rather than mental ability. I conducted a study of self-efficacy in mature, non-traditional science students ($n=60$) at Durham University, where the students were asked to predict the grade for a piece of work and add a comment about the assignment on a front sheet ($n=414$) before the work was marked. The sheet was returned to the students with tutors' feedback and the actual mark for the work. The estimated grade was then compared with the actual grade achieved and the difference between the two was used as a measure of self-efficacy, on the grounds that it measured the difference between a student's perception of their ability and their actual ability. There was a significant ($p=0.000$) difference between the estimates of grades by students who dropped out and those who completed the course, with those dropping out estimating on average 11.5 percentage points lower than those who stayed on the course. The achievement of these students was also significantly ($p=0.000$) lower by 10.4 percentage points, so their low self-efficacy was born out by their lower achievement levels (Inman & Wesson, 1998 (now Marshall)). Attribution may also play a role in whether a student withdraws or stays with the course. If the students with low self-efficacy attributed their lower performance to lack of ability then they would not perceive that they had the ability to improve their performance and so be more likely to withdraw. In this study the majority of students underestimated their grades. Only 7.5% of estimates were over estimates and there was a difference between men and

women, with 13.0% of the estimates from men showing an over estimate, compared with 2.9% from women, Table 4.1. When women under estimated, they did it by a greater degree than the men did at 27.2 percentage points lower than their actual achievement compared with 21.4 for men, Table 4.3 (Inman & Wesson, 1998).

Table 4.1 Variation in Type of Estimates between Men and Women (Inman & Wesson, 1998, p.10)

	No Estimate	Over Estimate	Underestimate	Correct Estimate
	% (no.)	% (no.)	% (no.)	% (no.)
Females	33 (78)	2.9% (7)	63.4 (149)	0.4 (1)
Males	13.4 (26)	13.0(25)	71.0 (137)	2.5 (5)
Total	24 (104)	7.5 (32)	66.8 (286)	1.4 (6)

Table 4.2 Variation in magnitude of over or under-estimate by Men and Women (Inman & Wesson, 1998, p.10)

	Average amount of Over Estimate	Average amount of Underestimate
	% points	% points
Females	9.1	27.2
Males	8.8	21.4

Women estimated significantly ($p=0.000$) lower than the men - the mean estimate for women was 52.3% whereas for men the mean estimate was 61.4%. There was no significant ($p=0.486$) difference in the achievement between men and women, however, with women achieving on average 77.8% and men 76.8%. One possible

explanation for the differing levels of self-efficacy for the women on this course might be that they have fewer positive role models in order to develop vicarious capability. Zeldin, Britner, and Pajares (2008) carried out analysis of self-efficacy in men and women who had chosen careers in science, technology, engineering or mathematics (STEM) and they found that, for men, mastery experiences were important in developing self-efficacy beliefs, whereas for women, social persuasions and vicarious experiences were more important in the development of their self-efficacy beliefs. Women starting to learn science, as in this sample, are likely to have had fewer opportunities to develop any meaningful self-efficacy beliefs, few mastery experiences, few role models to develop vicarious capabilities, they will not yet have experienced much in the way of social persuasion, and they may well be experiencing some levels of anxiety being in a new environment (Knowles, 1996).

4.2.3 Feedback Effect On Self-Efficacy

Feedback to students is a valuable part of social persuasion - the feedback that educators give to students can have a strong effect on self-efficacy either to undermine self-efficacy or to improve it. In studies with children who had maths or reading deficits, Schunk and colleagues were given three types of feedback regardless of their attainment (in Bandura, 1997). They were told either that they were capable, were working hard, or needed to work harder. The effects on their self-efficacy were then measured. Feedback relating to being capable produced the highest improvements in self-efficacy; effort attribution is not as effective at improving self-efficacy as in the long run it implies that the individual is not capable if so much effort is needed. Feedback has to be accurate to be of value in raising self-efficacy; excessive praise for mediocre performance can have the opposite effect, particularly in adults who are generally better at perceiving such indirect appraisal actions than children (Lord, Umezaki, & Darley, 1990) .

4.2.4 Intrinsic and Extrinsic attribution and Self-efficacy

People with high self-efficacy are more likely to cite intrinsic factors as important in their success and external factors as contributing to failure; whereas individuals with low self-efficacy are more likely to attribute in the opposite way. In the work of Frieze (1980) and Weiner (1986) (in Bandura, 1997) attribution is considered in two dimensions: locus of cause and stability over time. For example, ability and effort are both considered to be intrinsic, but ability is considered to be stable over time, whereas effort can change. Task difficulty and luck are both regarded as external attributes, with task difficulty being thought of as stable and luck being unstable. So an individual with low self-efficacy is more likely to attribute success to luck or ease of task, whereas someone with high self-efficacy will attribute success to ability or high level of effort (Bandura, 1997). Attribution is important in the learning process as it can influence subsequent actions. Someone with low self-efficacy who attributes success to luck, or failure to lack of ability is unlikely to change their learning habits as they are unlikely to believe that they have control over the outcome. Individuals with high self-efficacy who attribute their success to ability and failure to lack of effort are more likely to work harder in the future, as they perceive that they hold the control.

4.3 Consequences for Teaching Mature, Non-traditional Learners

When designing the Foundation Programme on which this thesis is based, aspects of self-efficacy were considered as a factor in supporting students to reach their academic potential. The factors of mastery experience, vicarious capability, social persuasion and arousal were all taken into account when designing the learning experience.

In my experience, tutors who express interest in teaching on the Foundation Programme are generally from one of two backgrounds: either they have come into adult education through teaching in schools, or have come to education later and now wish to facilitate other adult learners. It is important for the tutors who have come from school teaching to recognise that the low self-efficacy that some students will have from poor mastery experiences at school may be reinforced if the same methods of teaching are employed as the students experienced first time around. Tutors' own experiences may be of value with regard to vicarious experience for adult learners, particularly for women involved in science education. If this is the case then the choice of tutors may be important in providing this method of enhancing self-efficacy. Tutors who have come into adult education because they themselves came to education later can be of great value as positive role models for adult learners.

The feedback that tutors give to students can provide an avenue for social persuasion which can enhance or reduce self-efficacy beliefs. The work by Schunk *et al.* and Lord (in Bandura, 1997) indicates that feedback needs to be realistic and focused on competencies rather than effort. Dweck (2000) also researched the effect of feedback and found that person-orientated rather than outcome- or strategy-orientated feedback was more likely to make children vulnerable to the effects of failure. The comments made by tutors to students on the sheets returned to students in the Durham study (Inman & Wesson, 1998) were categorised into four basic types of comment: reassurance, which included general praise and comments on what was good about the assignment; advice, with specific points of strategy or comments on how to improve; effort, where tutors commented about the amount of effort either positively or negatively; and problems where tutors pointed out what was wrong with the assignment with comments about the students being confused or having problems. What was clear was that most of the feedback contained at least one

comment that involved some form of praise or reassurance that the student had done things correctly. Very few comments focussed on effort and the other comments were fairly evenly split between saying what was wrong with the work and offering advice on how to improve the work ,Table 4.3. From the point of self-efficacy, it is better to give feedback of the advice type rather than just describing the problems; the former gives the message that the attribution is changeable and controllable by the student; the latter is more likely to be perceived as being attributable to ability and therefore not changeable or controllable by the student. One message to take from the work on self-efficacy is to try to maintain a high level of reassuring comments, particularly if they focus on specific aspects of the work which were done well and move more of the feedback comments to the advice style rather than just saying what was wrong with the work.

Table 4.3 Different types of feedback

	Reassurance	Advice	Effort	Problems
Example	Have more confidence; you've done very well.	...aim to develop a more academic style...by reading more texts, journals, articles etc.!	Although...a lot of time and effort has been spent writing this up, there is not a lot of evidence of original thinking	You lost a number of points because you rounded incorrectly
Number	299	110	14	135

The research outlined above shows that considering self-efficacy issues are important in all educational settings, however, it may be argued that they are of even more importance when teaching adults. As discussed earlier, mature students are more likely to be from lower socio-economic backgrounds than traditional students and therefore more likely to have low self-efficacy beliefs due to previous school experiences. This means that educators of adult returners to education are not just

helping students develop positive self-efficacy beliefs, but hoping to undo the damage to self-efficacy caused by previous experiences. Careful consideration of mastery experiences, vicarious experiences, verbal persuasion and low anxiety learning environments should help mature students improve their self-efficacy and consequently their performance.

4.4 Conscientiousness

The work on self-efficacy has outlined ways in which mature students may be at a disadvantage when compared to traditional students, however, as previously noted, there is evidence that mature students, and in particular mature women, do well in Higher Education and that they bring something that compensates for their lack of cultural capital. Earlier in this chapter, the recognition by students of the need to take responsibility for their own learning was suggested as a difference between compulsory education and adult education. This recognition of responsibility may also be a factor of conscientiousness. Conscientiousness is recognised in psychology as being one of the 'Big Five' important personality traits. The Big Five personality traits or Five Factor Model (FFM) were first described in their current form by Digman (1990) as a grand unifying theory of personality and explored further by a number of researchers (Block, 1995; Costa & McCrae, 1992; McCrae & John, 1992; Poropat, 2009). The five factors in the model are agreeableness, conscientiousness, extraversion, neuroticism and openness which are described as being able to measure different traits in personality without elements of overlap. The trait of conscientiousness is used to describe the tendency to be self-disciplined, to aim for achievement particularly with regard to outside expectations, to prefer planned over spontaneous behaviour, to demonstrate orderliness and to act in a dutiful manner. Agreeableness refers to traits of compassion and cooperation as opposed to suspicion and antagonism; extraversion refers to assertiveness and sociability;

neuroticism refers to a tendency to experience anger and anxiety; and openness refers to being inventive and curious as opposed to consistent or cautious (McCrae & John, 1992).

There have been studies of the effect of age on conscientiousness, both longitudinal (Klimstra, Luyckx, Germeijs, Meeus, & Goossens, 2012) and cross-sectional (Soto, John, Gosling, & Potter, 2011) in nature and most show a high degree of stability of all of the five traits in adulthood. For example, a study of adult workers showed stability in the FFM traits across a four-year period and did not find a relationship between changes in the traits and adverse life events (Cobb-Clark & Schurer, 2012). For conscientiousness, studies have shown that there is an element of maturation required for development of the trait (Digman, 1990; McCrae & John, 1992) with conscientiousness increasing with age. A recent study by Soto *et al.* (2011) showed that a typical 65-year-old demonstrates a greater level of conscientiousness than 85% of early adolescents.

In addition to the effect of age on conscientiousness, there have also been studies on the effect of sex, showing that women tend to report higher levels of conscientiousness than men (Costa, Terracciano, & McCrae, 2001; Kelly, O'Flynn, McLachlan, & Sawdon, 2012; Schmitt, Realo, Voracek, & Allik, 2008). A further finding was that men were more likely to differ between cultures than women and there is a speculation that, in order to fulfil their developmental potential regarding conscientiousness, males require more resources than females (Schmitt *et al.*, 2008). Comparisons of differences in conscientiousness across different cultures indicate that higher scores of conscientiousness are more likely to be reported in individuals who live in cultures where large inequalities in power structures are accepted (Schmitt *et al.*, 2008).

Summary

As outlined previously, student retention in Higher Education is likely to be affected by the extent to which there is balance in learner identity and an inclusive education should focus on students' sense of belonging, motivations for studying and expectations of the course and themselves. What is less clear is the role of conscientiousness and the extent to which learning and teaching practices can support or mitigate the effect of this personality trait.

The lessons from adult education show that to manage inclusive education, there are a range of practices which can be considered. Providing interactive learning sessions where students can input as well as teachers and students' experiences are utilised and valued will support recognition of students and offer vicarious experiences to improve self-efficacy. Focusing on assessment styles with frequent, portfolio style tasks will help provide mastery experiences to develop appropriate levels of self-efficacy. Feedback which engages with attribution theory will allow students to gauge their progress and recognise activities which will help them improve. These activities may well be considered good practice, but they are not yet common practice in Higher Education, where the dominant teaching style is the lecture, summative assessment is frequently exam-based and concentrated at the end of the year and feedback is frequently characterised as unhelpful and too late in the National Student Satisfaction Survey. Consequently the teaching on the Foundation Programme needs to enable students to cope in what may be a less supportive environment as they progress through the rest of their degree.

It is pointed out that much of what goes under the banner of 'adult education' is in fact applicable to most forms of teaching, that we are talking about 'good education' rather than the specifics of *adult* education."

(Rogers & Horrocks, 2010, p. 44)

CHAPTER 5: Determining Measures of Success

Introduction

In order to explore what configuration of factors affect success, it is necessary to have some clarity on what is actually meant by success in this context. Success could be considered to be passing the Foundation Programme and progressing to level 1 of the degree, or it could be achieving the degree at the end of the course. Given the emphasis by universities and employers on 1st and 2:1 class degrees, this could also be considered a measure of success. Given the higher rates of withdrawal of non-traditional students, frequently for non-academic reasons, (Milburn, 2012), these measures of success may not capture the full picture. Another aspect of measuring success could be to measure how prepared the students are to study in a research intensive university, which is a more complex undertaking.

This chapter explores the pedagogical theories which may provide a basis for evaluating student success and the effectiveness of Foundation teaching in preparing a diverse range of students for undergraduate study. Ideas of 'graduateness' and the importance of critical thinking skills are explored along with the difficulties inherent in articulating a definition of, or a method of assessing, desirable thinking skills. Concepts of enculturation, communities of practice and threshold concepts are considered as mechanisms for defining a desirable outcome for Foundation students, leading to the suggestion that an ability to understand and apply evidence may be a suitable measure of desirable thinking skills in a research intensive university.

5.1 A Definition of Durham University Foundation Programme Success

In order to evaluate the success of Foundation Programme teaching, it is important to articulate what change is needed in students' knowledge and skills during the Foundation year that will indicate that a student is appropriately prepared to begin

their degree programme. As the ultimate outcome of the Programme is to produce graduates, it is helpful to explore some of the ideas around 'graduateness', a fairly recent term to describe what it is that "distinguishes university graduates who have completed an entire degree programme from non-university graduates" (Steur, Jansen, & Hofman, 2012, p. 862). Graduateness is not an easily defined term with most researchers in this area acknowledging the contested nature of the concept, but there does seem to be consensus that it is something more than a list of skills considered necessary for employability (Bernstein, Ettema, Suzuki, Fujii, & Osman, 2012; Glover, Law, & Youngman, 2002). Steur *et al.* describe graduateness as the "ability to make connections...between conceptual understanding and skills" (2012, p. 862) and they also make explicit the idea that graduateness implies some form of transformation of the individual. This idea is similar to that of Kreber's discussion of graduateness including the "development of a certain kind of person" (2014, p. 91) rather than the list of generic graduate attributes inspired by the employability agenda. So graduateness seems to imply a transformation into an individual who has an understanding of how knowledge is constructed and who has a sophisticated way of dealing with knowledge – academic thinking – and if the aim is to consider the Foundation Programme as preparing students for this transformation it will be helpful to explore the parallels between the discourse on graduateness and that of critical thinking. Like graduateness, critical thinking, despite the difficulties in defining it, in all the "debates about critical thinking, there is perhaps one single point on which virtually all agree, that it...should be the goal of a higher education" (Moore, 2011, p. 261). Consequently I explored the literature on critical thinking in order to identify what I am referring to as 'academic thinking' by which I mean an assessable and transformative way of making links between conceptual understanding and skills.

5.2 Everyday Thinking Compared with Academic Thinking

Children come to education already having made some sense of the world around them which may or may not be endorsed by academic explanations, and these prior understandings must be addressed before children can begin to apply an academic explanation (Duschl, Schweingruber, & Shouse, 2006). This is also likely to be true of adult learners who were not able to access education successfully as children for the reasons outlined in Chapter 2 and who have had so much more time to develop misconceptions. It is likely that non-traditional adult learners will come back into education with a mixture of misconceptions and real knowledge which need to be distinguished and either challenged or built on, in order to develop both understanding and confidence.

There seems to be a distinct difference between the strategies involved in everyday thinking and those required for a robust, academic approach to use of evidence: Duschl *et al* (2006) recognise that children use different strategies to solve arguments in everyday life compared with those they use in the classroom, and this has been described extensively for adults in Gilovich's book (1993) *How we know what isn't so: the fallibility of human reason in everyday life*. Here he describes many ways that everyday reasoning differs from academic reasoning, even when individuals feel that they are being objective. These include a tendency to look for corroboration rather than evidence that will disprove an idea; data collection methods that filter out contradictory information; inability to distinguish beliefs which are long-held due to accretion of academic evidence versus those which have traditional support; interpretation of data so that ambiguous data supports an idea or unambiguous contradictory data is reinterpreted to be discountable or minimised in its effect; and association with like-minded people who reinforce beliefs. This indicates that adult education needs to address the disconnection between everyday thinking and academic thinking.

Duschl, Schweingruber and Shouse (2006) argue that critical thinking skills are needed to support areas of scientific understanding that are counterintuitive and that adults as well as children have particular difficulty with distinctions between theory and evidence, managing contradictory evidence and understanding the ways in which knowledge is constructed.

5.3 Critical Thinking

Defining Critical Thinking

There is currently an acknowledgement that critical thinking should be an explicit aim of the curriculum, in both schools and post-16 education and courses changed accordingly, although there is yet to be consensus on how to achieve it (Pithers & Soden, 2000). Examining the literature on critical thinking, it has become apparent that one of the greatest challenges in this field is to define clearly what is meant by critical thinking skills and the way in which they may be measured. This issue was also noted by Krupat *et al.* in their review of definitions of critical thinking where they recognised that “critical thinking suffers from a lack of conceptual clarity and numerous questions about it go unresolved” and they point out that while different definitions of critical thinking may not be “mutually exclusive, the differences in focus are remarkable” (2011, p. 626).

There have been many frameworks and classification systems developed to try to capture the essence of what is meant by “thinking” since Bloom published his taxonomy of thinking skills in 1956. There seem to be as many definitions of critical thinking as there are individuals writing about it, for example, in 2005 Moseley *et al.* published a report for the Learning Skills Research Centre which identified 55 different thinking skills frameworks and they subsequently went on to evaluate 41 different models. Mosely *et al.* however, found that, while evaluation was common to

most of the critical thinking frameworks they analysed, on the whole they failed to find much in the way of unifying themes, with the author of each framework seeming to have “an individual conception of ‘good’ (i.e. ‘critical’) thinking” (2005, p. 21).

Obviously without a clear consensus on a definition of what is meant by critical thinking, it is difficult to imagine what form a widely recognised assessment of thinking skills might take. Moseley *et al.* acknowledge that while the critical thinking frameworks may be used to define critical thinking, however clearly or otherwise, there is great difficulty in assessing critical thinking. They point out that assessing single aspects of critical thinking may fail to “capture either the quality of that thinking or the relation of the identified thinking to the task which aims to assess it” (2005, p. 23). They use the analogy of learning to drive where some aspects may be learned in a classroom situation, but assessment needs to be conducted in a real-life situation.

5.4 Thinking Skills for a Research Intensive University

Given the difficulty of articulating the wide-ranging definitions and assessment of critical thinking, it may be better to focus on a narrower aspect of the thinking skills; specifically on what Foundation students are being prepared for, which is to engage in ‘research-led’ education. There is a body of literature on the relationship between research and teaching in Higher Education which has given a clearer articulation of what would constitute the thinking approach that would be of benefit to a progressing Foundation student.

5.4.1 The Relationship between Research and Teaching

For many years there has been a belief that being a good researcher leads naturally to being a good teacher and there have been numerous attempts to establish a positive correlation between the two, however, a meta-analysis carried out by Hattie and Marsh (1996) based on 58 articles found the overall correlation to be 0.06. This

lack of correlation is corroborated by other research (Entwistle, McCune, & Hounsell, 2002) with the benefits of research productivity to teaching being described as “extremely small” and “essentially unrelated”. Hattie and Marsh (2002) explored this further and suggested that perhaps the overall correlation hid two extremes based on two “diametrically opposed beliefs” and that for those who have a positive view of the relationship between research and teaching the outcome would be positive, with the opposite for those who have a negative view.

Given the lack of a simple correlation between good research and good teaching, further work has been done to try to delve further into how the activities of research and teaching may influence each other. There is evidence which indicates that rather than good researchers making good teachers, it is more likely that the learning and teaching process in Higher Education is enhanced by being infused with research in some way (Hunter, Laursen, & Seymour, 2007; Jenkins, 2004). Other researchers report that students like and value having research as part of their learning experience (Pascarella & Terenzini, 2005; Zamorski, 2000) and that being exposed to research outputs and processes supports the process of students becoming better scholars and practitioners (Garrick & Rhodes, 2000; Zetter, 2002). This focuses the significance away from transmission of the substantive knowledge as the most important outcome of research-led teaching, and onto the thinking processes that lead to good research i.e. that research-led teaching is showing students how to think as researchers.

Brew (2012) suggested that there should be a model of undergraduate education based on the concept of inducting students into ‘communities of practice’ with a move away from information-transmission and more towards conceptual change. She describes an academic community of practice as the “students, academics, professionals and indeed anyone else who shares this site of practice” and says that

they “are responsible for the maintenance of the community of practice for inducting newcomers into it, for carrying on the tradition of the past and carrying the community forward to the future” (p. 109). It could be considered that the community of practice into which Foundation students are being inducted is that of a research-led university, without being too specific regarding the form of research, as students are going to be progressing to a range of disciplines. Consequently it will be helpful to explore the concept of communities of practice to form an understanding of what preparedness for degree level study might mean.

5.4.2 Communities of Practice

The concept of communities of practice was first proposed in 1991 by Lave and Wenger in *Situated Learning* which explored apprentice learning. The concept has been further developed by Wenger (1998) and is a theory of learning based on the idea that it is engagement in informal, social groups with a common goal that shape learning rather than the individual or the organisation. The learning that follows may be intentional or incidental, but that learning occurs is one of the definitions of a community of practice. A community of practice has a clear domain; an area of shared interest to which all members have some commitment and shared competence. In this definition the members of the community must interact with and learn from each other in some way and it is these processes of sharing resources, such as experiences and mechanisms for problem solving, which define the practice. There is a strong aspect of enculturation in the concept of communities of practice which is also evident in the ideas around constructivist teaching and learning.

Constructivism was developed in the 1980s from the ideas of Piaget who suggested that individuals use their experiences to construct new knowledge (Fosnot, 2005). Phillips describes three types of Constructivist learning: active learning involving discussion, investigation and hypothesising; social learning involving social construction of knowledge in dialogue with others; and creative learning where

learners create or recreate knowledge for themselves, and argues that teachers should be directing learners in a way that will enable them to rediscover established theories (1995). The debate surrounding the use of constructivist methods in education has given rise to some insights into the process of education being one of enculturation as Bereiter describes:

“There seems to be a growing awareness...that there is more to learning science, mathematics, or history than mastering an organized body of content and a set of procedural skills... There is a kind of enculturation that must go on if a student is eventually to become an insider, a participant in a discipline, rather than someone viewing the disciplines entirely from the outside.”

(1994, p. 22)

Hodson articulates this enculturation as having the capacity to use both practical skills and conceptual understanding in a meaningful way but which is “often not well articulated or even consciously applied” (1996, p. 130). This mirrors the definition of gradueness proposed by Steur *et al.* (2012) as having the ability to make connections between conceptual understanding and skills.

5.4.3 Concepts of evidence

If the Durham Foundation Centre is inducting students into a community of practice that is a research-intensive university then perhaps one way to measure student preparedness will be to identify a research-thinking approach; a preparedness to engage with ideas underpinning research. This then led to an exploration of ideas around the use of concepts of evidence as an important conceptual understanding which also links to research skills and may also be considered transformative knowledge.

The ideas around concepts of evidence arose out of work by Duggan and Gott (2002) who carried out research into the way adults used science in science-based employment and in everyday life, and identified certain concepts of evidence such as validity, reliability, uncertainty and risk as being important. Gott, Duggan and Roberts (Gott & Duggan, 2007; Gott & Roberts, 2008) then developed a model demonstrating that these ideas of the concepts of evidence can be used at different levels.

The bull's-eye model, Figure 5.1, they produced has a single datum at the centre indicating that the foundation of all scientific work is how measurements are made and an initial concept of evidence is to understand the importance of measurement in terms of aspects of instrument calibration and sensitivity, for example. This can be applied to social science investigations, for example, with regard to questionnaire construction and interview methods. The second layer is a data set and this concept refers to understanding the reliability and validity of evidence is dependent on sampling methods to ensure that the data is representative of the population of results being studied. The understanding of an iterative approach is required here, that students are willing to keep collecting data and readjusting their method until they are sure that the data collected is representative. The next layer outlines the importance of appropriate data analysis, using correct statistical analyses, for example, and not extrapolating the data beyond what is warranted. In all three of these layers there is an overarching theme of the uncertainty of measurement as outlined by Buffler and Lubben (2001) in describing the transition that students need to make from a 'point' view of data i.e. that there is a single correct answer to a 'set' view of data i.e. in real world situations there is no right answer. The outer two layers are to do with siting the data in a wider literature and also about the authority and independence of the author of the research. This mirrors a view of gradueness proposed by Perry's (1970) model of an educational journey taken by undergraduates away from a concept of knowledge as being a dichotomy of

absolutes and truth, to a more differentiated understanding of knowledge which includes the concept of uncertainty. The bulls-eye model moves beyond Perry's model, however, in that Gott and Roberts devised tests of concepts of evidence which provide (Glaesser, Gott, Roberts, & Cooper, 2009; Gott & Duggan, 2007; Gott & Roberts, 2008) a mechanism for measuring how far along the journey students have reached.

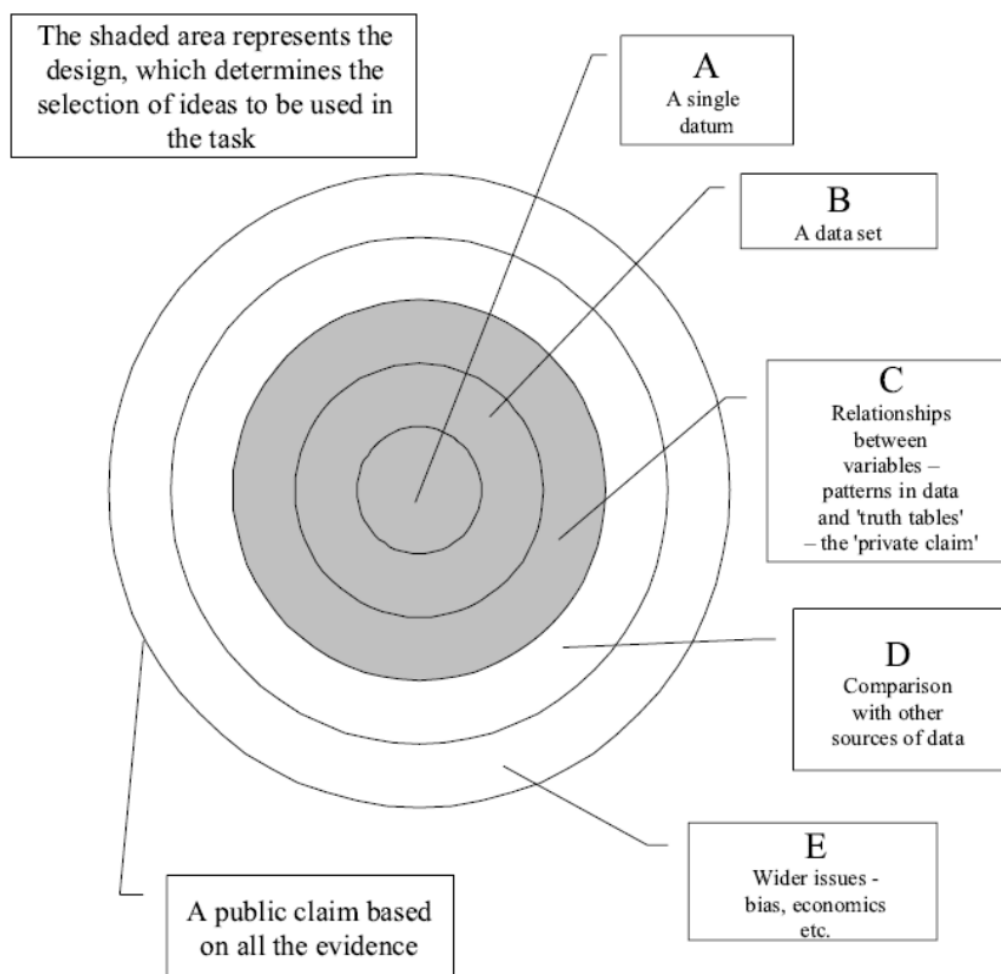


Figure 5.1 Bull's-Eye Model (Gott & Duggan, 2007, p. 279)

5.5 Concepts of Evidence as a Threshold Concept

As well as reflecting definitions of gradueness in linking conceptual knowledge and skills, concepts of evidence can also be seen as including the transformative aspect of gradueness if they are considered as a threshold concept. The ideas of troublesome knowledge and threshold concepts also arose out of the constructivist approaches to teaching and learning. Perkins evaluated different types of knowledge which learners find difficult to assimilate i.e. troublesome knowledge; he described inert, ritual, conceptually difficult and alien knowledge (Perkins, 1999). In their development of this idea of troublesome knowledge, Meyer and Land (2005) added in a further category which they described as tacit knowledge, where the knowledge is used but not openly acknowledged. As Perkins stated “we often get the hang of enquiry in a discipline without having a clear reflective conception of what we are doing” (2006, p. 40). Meyer and Land expanded the notion of troublesome knowledge and proposed that there are certain key concepts in any given discipline which frequently are troublesome for learners, but that once the learners have mastered these concepts they have crossed a threshold to a new way of perceiving not only the discipline, but frequently their identity with respect to that discipline.

As well as being troublesome, Meyer and Land distinguish a threshold concept as having four other characteristics: transformative, irreversible, integrative and bounded. By transformative, they propose that it causes a shift in the student's perception of the subject and that it may cause a shift in personal identity. The irreversible nature of threshold concepts means that the student is unlikely to unlearn the change in perspective without considerable effort. Meyer and Land connect this irreversibility to the discomfort that some students feel with their new-found knowledge and that at a distance, practitioners find it difficult to remember what it was like to be in that untransformed state. An important characteristic of threshold concepts is that they are integrative - students are able to perceive interrelatedness

in the discipline that was not previously obvious to them. The fourth characteristic they propose is that threshold concepts are bounded and may mark boundaries between disciplines.

Meyer and Land acknowledge that threshold concepts are “more readily identified within disciplinary contexts where there is a relatively greater degree of consensus on what constitutes a body of knowledge (for example Mathematics, Physics, Medicine)” (2005, p. 15). They hold the view that threshold concepts are those that lead students to be enculturated into the ways of thinking and practicing that are required to be a member of that academic body; just learning information is not enough, a student must also be able to use it and apply it in real situations. The new identity that learners take on when they cross the threshold may be apparent in the use of the language of the discipline in an authoritative way; a learner has to be enculturated into the field - thinking and talking as a member of that new society. A learner on one side of the threshold uses different language and different ways of thinking than they do once the threshold has been crossed. Students coming from different cultures may be more resistant than others to the transformative nature of learning and therefore there is unlikely to be a simple answer based on a reorganisation of the curriculum which will help all students overcome the threshold (Cousin, 2006).

Rowbottom (2007) criticises Meyer and Land for not defining the term concept, although he goes on to give three definitions of concepts and recognises that Meyer and Land probably use concept to mean a “word-like mental representations” (2007, p. 265). Rowbottom goes on to argue that “concepts are not reducible to abilities [and] that acquisition of a given concept can be necessary, but not sufficient, for the possession of an ability” (2007, p. 263). He argues that whether something is ‘threshold’ is not intrinsic, but will be different for different learners. For these

reasons he argues that the current definition of threshold concepts makes it impossible to empirically isolate them (Rowbottom, 2007). A decade on, however, the theory of Threshold Concepts has been widely accepted as a powerful approach to curriculum design (Billie, Bowden and Meyer, 2012) and it has many similarities with aspects of the concept of communities of practice. Both embrace the idea of students becoming enculturated into a discipline and the recognition that once a student has crossed a threshold they develop an identity which includes being part of the community of practice.

One aspect of the threshold concepts is that they are generally based on substantive understanding, however, it is possible that concepts of evidence, as described by Gott and Duggan, could be considered as an important threshold concept for making the transformation to academic practice. Studies conducted into understanding of concepts of evidence (Lubben & Millar, 1996; Millar, Lubben, Gott, & Duggan, 1994) indicate that concepts of evidence are likely to be transformative in that once students have grasped these ideas they will then view research in a critical way which will preclude mechanical performance of practical skills without consideration. There is likely to be an element of identity transformation that comes with a clear understanding of concepts of evidence. Before the threshold is crossed students are more likely to view research and researchers as separate and not open to question. Once concepts of evidence are grasped, the student has the tools to critique evidence and if they don't necessarily see themselves as researchers, the academic community will have lost some of its mystique, and the student is becoming part of the research-led community of practice.

The concepts of evidence are clearly integrative in that they apply across disciplines and allow students to approach research with a clear understanding of how to proceed. They are also irreversible in that, once a student has learned a critical

approach to evidence, they are unlikely to return to more naïve methods. Certainly concepts of evidence tend to be troublesome in the context that they are frequently transmitted tacitly in educational settings; Davies notes that threshold concepts are “taken for granted by practitioners in a subject and therefore rarely made explicit” (2006:74). As Roberts (2001) states of concepts of evidence; “Some pupils will pick up these ideas in the course of the traditional study of science, but many will not.” (2001, p. 114).

Threshold Capabilities

In a recent development, partly to address the focus on substantive knowledge inherent in the Threshold Concept theory, this theory has been merged with Capability Theory to produce a more comprehensive approach referred to as Threshold Capabilities. Capability Theory focused on the behaviours demonstrated by students in applying knowledge in novel situations with a greater emphasis on how substantive knowledge is known rather than what is known and relates them to the relevant discipline (Baillie, Bowden, & Meyer, 2013). Concepts of evidence fits well into the Threshold Capability Integrated Theoretical Framework, consisting both of a substantive knowledge of ideas about evidence and the skill of being able to apply the concepts in a real situation.

For the purposes of this thesis, therefore, I argue that mastering concepts of evidence, so that they can be applied in novel situations, is an aspect of enculturation into the community of academic practice that is a research intensive university. The ability to understand and apply concepts of evidence embraces ideas of gradueness, in that concepts of evidence provide a mechanism by which students can link conceptual understanding with research skills, and in that these concepts may be viewed as transformative.

5.6 Using a Project to Assess Students' Use of Concepts of Evidence

Having accepted that an ability to understand and apply concepts of evidence is an important definable thinking skill which will prepare students for degree-level study, it is important to articulate how this ability will be measured. As Gardner (1991) noted, students who are at the stage of learning scholastic approaches to literacy, concepts and disciplines will be able to give the correct response when asked about a particular concept, but will then not use that same concept, but revert to intuitive responses when trying to apply knowledge in new contexts that do not resemble the standard learning formats. This is because frequently teaching does not help students reconcile the preconceived ideas already formed prior to education with the new, sometimes counter-intuitive concepts being delivered in the scholastic setting. This leads to students developing two separate, sometimes conflicting sets of concepts which they apply in different contexts, e.g. 70% of physics students who had taken a mechanics course erroneously described a tossed coin as having two forces acting on it (Gardner, 1991).

Ryder (2002) investigated the benefits and challenges of research projects in undergraduate courses within several science departments and found that “many students had transformed their view of how science research works” (pg17). He particularly noted the improved levels of responsibility and motivation, but also the challenges that students faced, “in particular, the difficulty of getting reliable results in science research was a shock for students used to carefully designed practical activities within laboratory courses.” (pg18). Consequently this thesis explored students' understanding of concepts of evidence using the test devised by Gott and Roberts (2008) and also students' ability to apply concepts of evidence in a research project. Not only do students benefit from engaging in project work and experiencing the uncertain nature of evidence which is vital for an academic approach, projects

can also be used to assess the extent to which students are able to apply their understanding of concepts of evidence to real data.

Summary

There is a great deal of literature on the importance of critical thinking as a part of the curriculum throughout compulsory education and into Higher Education and as a vital aspect of defining 'graduateness'. There are clear problems with defining graduateness and critical thinking and even more with assessing them, consequently a narrower aspect of the more generic term critical thinking has been explored for this thesis. The ability to demonstrate an understanding of concepts of evidence and apply them in the context of a small research project can be used to measure preparedness for induction into the community of practice of a research-intensive university. This is setting up the assumption that being able to demonstrate an understanding of concepts of evidence will lead to a good project and that this will indicate success at Foundation level and subsequently success at degree level.

CHAPTER 6: Design of the Study

Introduction

The previous chapters have outlined the underrepresentation of some groups in Higher Education and considered some of the explanations for this, including inadequate initial education, biased recruitment practices or learner alienation. The purpose of this chapter is to outline the approach taken in designing a study of one particular widening participation initiative which was developed to increase participation by non-traditional mature students in Higher Education. The study attempts to identify factors which will affect the retention and success of non-traditional students studying on a Foundation Programme as a means to progression to degrees at Durham University. The factors considered will be based on those outlined in the literature review, specifically aspects of initial education, sex, age, conscientiousness and socio-economic class.

The first part of the chapter articulates the focus of the research shaping the study and this is followed by a quantitative description of the student population on which the study is based i.e. the students of the Foundation Centre in Durham University, particularly in regard to what extent the students characterise underrepresented groups. In addition to this quantitative data, quotations taken from a set of interviews with three typical non-traditional, local, mature students have been included to illustrate qualitatively that the Foundation students studied are typical of the underrepresented groups described in earlier chapters. There then follows a description of how the study was conducted, including the teaching on the Foundation Programme, the tests used and the data collected.

In this particular study my positionality as a researcher also needs to be examined as I took on several roles during the course of this study. Not only was I collecting data from students as a researcher, but I was also the teacher for many of these students

and also, as Director of the Centre, an individual with a great deal of authority during their year on the Foundation Programme. A further aspect to be considered was that I was also a student of Durham University, albeit in a different department. Consequently I have included a short section on reflexivity in this chapter.

6.1 Reflexivity

According to Lincoln and Guba (1985), the validity of qualitative research can be negatively affected by three main issues: reactivity, respondent bias and researcher bias. Reactivity is used to describe the effect that the researcher has on the setting of the research; respondent bias is the way in which the subject of the research is reacting to the data collection e.g. in interviews, being obstructive because they see the interviewer as a threat or trying to give the interviewer the responses they judge the interviewer wants; and researcher bias is a result of the preconceptions and assumptions that affect the way in which the researcher conducts the research (Robson, 2002).

There are a number of strategies which can be used to minimise the effect of these problems (Padgett, 1998) and some of these strategies are outlined here. Prolonged involvement is useful to reduce both respondent bias and reactivity because the respondents become more trusting of the environment and the process of the research, however, it can lead to greater researcher bias as a greater emotional response to the setting can develop and detachment becomes more difficult to achieve. Triangulation is regularly used to improve validity of research and Denzin (1988) described its use in social research as using a range of sources, approaches, interviewers or observers, or theories. Peer debriefing and support can help reduce researcher bias and allows the researcher to put some emotional distance between themselves and the research setting (Robson, 2002). Member checking (Bloor,

1997) can guard against researcher bias and is the process of returning to the respondents with the findings of the research to gain their views. Keeping an audit trail of the research process allows for regular reviews of the progression of the research and this type of reflection supports the process of reflexivity which is a further, important strategy in reducing researcher bias (Robson, 2002).

Reflexivity is the process by which a researcher can recognise how their own social identity and background may have an impact on the research process. Ahern (1999) proposed that the “ability to put aside personal feelings and preconceptions is more a function of how reflexive one is rather than how objective one is because it is not possible for researchers to set aside things about which they are not aware” (p. 408). There are a number of practical steps that a researcher can take to develop a reflexive approach to their research (Ahern, 1999; Fox, Martin, & Green, 2007; Robson, 2002) and to recognise areas which are likely to provide a greater risk of subjectivity.

Reflexivity to Reduce Researcher Bias in this Study

In terms of my own reflexivity towards this research, I acknowledge that I have a liberal attitude towards education and hold strong beliefs that education should be accessible to everyone with the potential to benefit from it. I recognise the very powerful response I felt to reading Bourdieu’s work for the first time which articulated for me the process and reasoning behind what I felt to be an unfair system. Bourdieu’s work, for me, provided a theoretical framework to explain the apparent contradictions between what I felt to be right (that education should lead to a meritocratic society) and what I actually observed (those with money and power retained it).

I appear to be a product of the standard, traditional education system; I did well through school, went on to study A levels at 16 and then on to Oxford University at 18 where I studied for and achieved a degree in Biochemistry. Having worked for a while in medical research at an elite university in the USA, I returned to the UK and studied at another elite University, Durham, for my PGCE before gaining a job as a teacher in an independent school. On the face of it, it would appear that I have little in common with the non-traditional students with whom I work. My accent is unidentifiable beyond being northern and most people assume that, as with the standard pattern of academic staff at the University, I have moved to the area because of my work in the University. I am however, very much a product of the North-East of England. I represent the fifth generation of my family working on the site of Durham University's Queen's Campus at Stockton: my mother's family worked at the industrial company Head Wrightson's; she, her sister and both brothers followed their father, their grandfather and his uncle into the works (Grace, 2015).

My mother's family was working class and her habitus was defined by poverty and the need for my mother to go out to work at 15 despite having won a scholarship to the local Quaker school. Although my father came from a more middle class background and went to university before working in the Teesside steel industry, as Bourdieu (1973; 1990) and Reay (1998) indicate, children's habitus is strongly influenced by their mothers, particularly in the situation I experienced where there was a clear division of labour into gendered roles, with a stay-at-home mother and a father who worked long hours. I have some understanding of the struggle of local non-traditional students at Durham University because it echoes the dissonance I felt between my upbringing and the University culture at Oxford.

It is possible that my upbringing may cause me to weight results which support success in non-traditional students more favourably than results which indicate that despite the support given during the Foundation Centre they still do less well than traditionally educated students. In order to guard against this, I have utilised some of the strategies outlined above. For example I have worked in this field for 20 years and so have prolonged exposure to the setting; I used peer support by regularly reporting my findings to colleagues at our Centre scholarship forum, and found the input and suggestions very helpful; I have used a range of methods to collect data; and I have used an analysis method which has only a minimal level of subjective decision-making.

Respondent Bias

Being the Director of the Foundation Centre it is probable that I am perceived to have power and authority over the students in the study. The data was collected through tests delivered by me, marks collected by other members of staff, central data collection and through interviews conducted by me. Some of these methods are more open to respondent bias than others, for example the tests should be less affected by respondent bias than interviews may be, however, the students may not want to demonstrate what they are actually capable of during tests – they may be irritated by the testing process for what they see as my work which does not help them. I tried to ensure that there was clear rationale for the tests used and that there was pedagogic value to them e.g. identifying areas requiring additional support and explained this to students before they took the tests.

My prolonged exposure to the setting has meant that I have built up trust with students and interviewed students may have wanted to be helpful and supportive and try to give me the answers they think I want – particularly given my position as

Director. One way to mitigate against this was to only conduct interviews with students who had progressed to the first year of their degree where I no longer had any way of affecting their marks or outcomes.

6.2 Overview of the Data Collected for the Study

There were two major aspects of the study. The first one was a seven-cohort study which included audit-style data (i.e. data that were collected routinely for the management of the course) on demographics, academic grades and degree classification, and conscientiousness data for the four years from Foundation to degree. The second was a study of one cohort from the academic year 2010/11. For this cohort, in addition to the standard audit-style data, data were collected on their initial and final performances in a range of skills, including numerical skills, writing skills, critical thinking skills and ability to apply concepts of evidence as assessed in a test and its application in a project, Table 6.1.

Table 6.1 A Summary of the Data Collected from the Different Cohorts for this Study

	Cohorts – year of entry to the Foundation Programme		
	2004 - 2007	2008-2009	2010
Data known on arrival (audit)	<ul style="list-style-type: none"> • Age • Sex • Home Address • Previous Qualification • Programme of study 	<ul style="list-style-type: none"> • Age • Sex • Home Address • Previous Qualification • Programme of study 	<ul style="list-style-type: none"> • Age • Sex • Home Address • Previous Qualification • Programme of study
Data Collected in the first week (additional)			<ul style="list-style-type: none"> • Maths Test • Functional Writing Skills Test • Critical Thinking Test • Use of Concepts of Evidence Test
Data collected following end-of-year exams (additional)			<ul style="list-style-type: none"> • Use of Concepts of Evidence Test • Use of Concepts of Evidence in a Project
Data collected at the end of the year (audit)	<ul style="list-style-type: none"> • *Attendance • *Assignment submission • Foundation Average • Pass/ Fail/ Withdrawn 	<ul style="list-style-type: none"> • *Attendance • *Assignment submission • Foundation Average • Pass/ Fail/ Withdrawn 	<ul style="list-style-type: none"> • *Attendance • *Assignment submission • Foundation Average • Pass/ Fail/ Withdrawn
Data collected following graduation (audit)	<ul style="list-style-type: none"> • Degree Classification 		

*Used to calculate Conscientiousness Index described later in the chapter

6.3 Focus of the Study

From the literature review it appears that there are a range of possible reasons why non-traditional students are underrepresented in research-intensive universities.

These have been categorised in this thesis into three major groups:

1. Inadequate initial education
2. Recruitment bias (conscious or unconscious)
3. Alienation of the non-traditional student identity by the dominant learner culture in HE

These three factors are possible explanations of underrepresentation, and this study investigated to what extent these factors affect how successful non-traditional students are once they are in the University i.e. it explored the effects of inadequate initial education and factors which may contribute to alienation on the students' success. It was unlikely that there would be a single dominant factor and therefore Qualitative Comparative Analysis, as described in the next chapter, was considered as a useful tool to analyse the combinations of factors that affect non-traditional student success as measured in a variety of ways, including passing the Foundation Programme, doing well on the Programme, achieving an honours degree, achieving a good honours degree and being able to apply concepts of evidence in a project.

The focus of this study was to explore which combinations of factors provide the outcome of being successful in a research intensive university. With regard to initial education, the factors considered can include students' actual previous qualifications and also their ability on a range of initial tests. In respect of aspects of enculturation and alienation, factors to be considered in the configurations include students' age, sex, conscientiousness (as measured using students' attendance and submission of assignments) and immersion in the university culture – (as designated by being local, distant or overseas).

6.4 Assumptions

As outlined in Chapter 5, it is important to establish what measures will distinguish successful performance at Foundation level. The average mark that a student achieves on the Foundation Programme will be one way of measuring success, but that will be a combination of students being able to demonstrate that they know information and also being able to apply thinking skills which are suitably academic to that information. To be able to measure students' use of concepts of evidence will allow a distinction between what students know and the understanding about the

reliability and validity of the evidence underpinning that knowledge. Reviewing the literature has led to the following assumptions to be made:

1. That an ability to use concepts of evidence will demonstrate thinking skills which will support induction into the community of practice of a research-led university .
2. That this use of concepts of evidence will be important across the disciplines and not just for science-based programmes.
3. If being able to demonstrate an application of concepts of evidence is an indication of successful preparation for induction into the community of practice of a research-led university, there should be a correlation between performance on a project, performance at Foundation level and degree outcome.

6.5 Description of the Student Population in the Study

In this section quantitative and qualitative data are used to demonstrate the extent to which students on Durham University's Foundation Programme are typical of those underrepresented groups outlined earlier. The quantitative data were taken from demographic data collected as part of the registration process for each student. The qualitative data comprises quotations from a set of interviews which were conducted in 2008 with three Foundation Centre students who lived locally to the Queen's Campus in Stockton-on-Tees. The original purpose of the interviews was to explore the extent to which aspects of intercultural education, normally applied to overseas students, could be applied to local, mature, home students. The interviews lasted for about an hour and the questions asked were open to allow the students the opportunity to express their own views and feelings. The outcome of the interviews demonstrated that the same types of alienation and culture shock described by students from different international cultures was also experienced by students from the same nationality, but with different cultural capital (Marshall 2013). The

quotations from these interviews have been used here to give a “learner voice” to the individuals behind the statistics and to provide, to a small extent, an element of triangulation of data collection methods.

Since its inception in 1997, the majority of students recruited to the Foundation Programme at Durham University have been mature, local and without A level qualifications. There are data on 1386 students which record the students’ age, sex, home address, qualifications prior to entry, programme of study and average score on the Foundation Programme. As records were kept from 2004 on attendance and assignment hand-ins which could be used to create a conscientiousness index, only data from 2004 were used in this study, there were data for 830 cases. For students registered between 2004 and 2007 who progressed to degrees at Durham University, there are data on their subsequent year 1, year 2 and degree outcomes, which can be used as one measure of success. There are 234 cases in this group, Table 6.2.

Table 6.2 Demographics of the students registered between 2004 and 2010

Year of Entry	Percentage of Home Students with Non-A level Qualifications	Percentage of Home Students Local to the North East of England	Percentage of Mature Students	Percentage of Female Students
2004	90	79	71	57
2005	85	84	66	64
2006	85	82	79	55
2007	80	74	80	55
2008	79	66	73	41
2009	84	62	78	39
2010	74	60	80	43

6.5.1 Initial Education

The majority of Foundation students have not studied at A level. Most of the students left school at 16 with some GCSE equivalent study and may or may not have supplemented that with vocational qualifications gained either as a means to gain employment or as part of employment training. A few students had no formal qualifications at all. International students generally come with a school leavers' certificate from their own country. The students who were interviewed included Natasha* who was a 25 year old female student who left school with no qualifications, completed the Foundation Programme and progressed to the first year of a degree; Vince who was a 50 year old male student who completed his education at 16 and then went into heavy industry, he also progressed to a degree; and Rachel who was a 49 year old female who left school at 16 and was yet to complete a degree started five years earlier. These three students did not continue in formal education at the age of 16 and there is evidence of elements of disaffection with education during their compulsory schooling. Neither Natasha or Vince felt that there were any teachers at school who had their interests at heart; in fact Vince remembers being regularly caned at school and, on coming top of the class in Maths, was told by his teacher that it wouldn't do him any good. Natasha says that the teachers meant "nothing at all" to her:

To tell you the truth the teachers didn't care, they really taught you nothing. When I first started school I was dead excited and especially in sciences, I used to love Chemistry and stuff like that but then you'd ask some questions and they'd make you feel stupid for asking and stuff like that so in the end you'd just mess on and not be bothered.

Natasha

*Not the students' real names

6.5.2 Socioeconomic Status

The North East of England has the highest proportion of students from Low Participation Neighbourhoods in the UK and third highest for lower class students and state school students (HESA, 2008) and as can be seen in Table 6.2, the majority of home students on the Foundation Programme are local to the North-East. It is difficult to collect meaningful data on socio-economic status of Higher Education students, as they frequently do not declare the information used to generate this classification on their application form. For Foundation students who enrolled on the Foundation Programme between 2005 and 2010, 47.4% of home students were unclassified for the National Statistics Socio-economic Classification (NS-SEC). Other data shows that generally around 45% of the local, home Foundation students have come from Low Participation Neighbourhoods as defined by the government for widening participation and/or have a household income lower than £25K (data from DU Admissions office). This compares with 10% across Durham University as a whole (HESA).

The NS-SEC data that is available for the students enrolled between 2005 and 2010, Table 6.3, shows that the students who come from outside the local area were more likely to declare information (59.8%) than local students (49.8%) and were more likely to be from the top two NS-SEC groups (30.2%) than local students (15.4%). Both of these figures are low in comparison the proportion of the main undergraduate population of whom 54.4% were from the top two NS-SEC groups.

Table 6.3 Comparison of the Socioeconomic Groupings of Home Foundation Students by Origin, with the standard UG Population

NS-SEC Groups	Percentage of Local Students (No.)	Percentage of Distant Students (No.)	Percentage of All UG students (No.)
1	3.7 (18)	10.1 (19)	29.7 (3576)
2	11.7 (57)	20.1 (38)	24.7 (2966)
3	12.3 (60)	13.2 (25)	9.7 (1163)
4	1.8 (9)	1.1 (2)	3.3 (397)
5	0.4 (2)	1.1 (2)	1.7 (201)
6	11.3 (55)	11.6 (22)	4.7 (570)
7	4.9 (24)	2.6 (5)	1.5 (182)
8	0.0 (0)	0.0 (0)	0.0 (0)
9 unclassified	50.2 (245)	40.2 (76)	24.7 (2972)
Total	(488)	(189)	(12027)

In this study, given the large number of students who were unclassified with respect to NS-SEC, it was felt that just using NS-SEC groups would be insufficient. What the data show is an apparent difference between NS-SEC groupings for local students and distant students. This may be compounded by the fact that the local students were less likely to be completely immersed in the academic culture as they returned to their families each day, consequently managing two identities at the same time. Distant students on the other hand, have left their previous, non-student identity and are more likely to be able to develop a new learner identity by remaining immersed in a student culture. As a result of this, to explore the effect of home culture on students, they were divided into 'home local' and 'home distant' based on their post-code.

As outlined in the Chapter 2, this was a reasonable distinction to make. Taylor (2012) describes many Higher Education Institutions using 'local' to mean non-traditional, disadvantaged working-class groups (2012, p. 74) and Pollard notes the

geographical grounding of disadvantaged groups being a major factor in their being limited to local institutions (Pollard, 2008).

None of the three students interviewed felt that university was ever a consideration in their local, working-class families; there was no expectation of education continuing past 16. Vince explained that his family were concerned for him to be happy and healthy as he grew up, but he was expected to leave school and go out to work at 16.

So I went straight from there [school] to heavy industry. I served my time in an apprenticeship as a boiler-maker and plater. The job was already there, before I left school, it's like this old-boys' network, in the working men's club and my dad knew the guy that was doing the interview "Not a problem [name], the job's already there for him."

Vince

None of the three students interviewed indicated that they had received particular support from home; at best Vince experienced uninterested acceptance, while Rachel suffered distinct hostility from her husband and father. Many students find their support from other students.

6.5.3 Mature Students

The majority of home students on the Foundation Programme are aged 21 or over, usually around 75-80% each year, Table 6.2. Of the younger students most of them have had a break in their education and have not been involved in formal learning since they were 16 years old. Both age and experience will create differences between the non-traditional and traditional students, but, for the three students interviewed, there did not appear to be any sort of discordance between the different

groups of students. The students expressed expectations of being very different to the students from traditional backgrounds. Natasha describes her expectation of the typical Durham student:

Very posh. Loads of money, dead posh, nice families, happy. Just normal people.

Natasha

Vince describes a similar picture:

I thought it would be different to what it was. Because of the picture you see in the media of uni. life and most of uni. life is on shows like Morse, and things like that, and you get a picture, whether it's right or wrong, you get a picture that's painted and that's to a certain extent what I expected.

Vince

But he goes on to describe his reality:

It was great, people like me most of the time, different ages, obviously, but there were people from different backgrounds, but nobody was standoffish. I thought everybody, no matter what background or age group they were, especially on the Foundation Course, seemed to want to mix. And even to a certain extent the degree course, I think people interact well. There's a few, you're always going to get one or two that don't seem to ... but that's ok I don't mind that, but the reality was totally different to what I expected. I thought people interacted well and even with regards to the lecturers, the lecturers were different to what I expected; maybe an 'us and them' lecturer and pupil type of thing exactly as it was at school.

Vince

6.5.4 Sex

As outlined in Chapter 2, there has been an increase in female engagement into Higher Education so that they are now in the majority compared with male students (Gorard, 2008; Tight, 2012). The Durham Foundation Programme has observed the change in the opposite direction, Table 6.2. In 1997 the majority (71%) of students were female but this proportion has gradually changed to the current situation where males are in the majority (43% female in 2010). There may be many reasons for this change, political and/or social and it could form an interesting study in its own right.

6.5.5 Ethnic Minority

Compared with other areas of the country, the North East of England does not have particularly large ethnic minority communities (ONS, 2011). Consequently the number of ethnic minority students from disadvantaged UK backgrounds on the Programme is small. The Programme does have data on the performance of non-UK, non-Caucasian students, however. In 2001 the Foundation Centre developed a specific pathway for Overseas status students starting with 5 students in the first year, increasing gradually each year to 53 by 2010.

6.6 Demographics of the 2010 cohort

In October 2010, 156 students were registered on the Foundation Programme. Of these, 10 students withdrew either without attending any classes or within a few weeks. A further 8 students withdrew from the Programme over the course of the year. In most cases, the 2010 cohort was similar to the general population of Foundation students since 1997. The main difference with this group was that, for the first time, the cohort was split between the Queen's Campus, Stockton site and the Durham City site during their Foundation year. The numbers of international students (26.9%) and those from outside the North East (25.0%) were approximately equal, and local students (48.1%) made up nearly half of the students in the study.

The data show the same trend with regard to sex that has been observed over several years, which is that there were more men (57.1%) than women (42.9%) on the programme. The students ranged in age from 17 to 51 years old.

The most common type of qualification among the students was some form of vocational qualification such as BTEC or City and Guilds, Table 6.4. The traditional qualifications group contained students who had studied to at least AS level, but who may not have completed an A level course of study. Those who had A levels were likely to have studied them some years earlier, and they may not be relevant to the degree progression.

Table 6.4 Previous Qualifications of Foundation Students in the 2010 Cohort

Highest Qualification	Frequency	Percentage
A or AS level	31	19.9
GCSE	20	12.8
Higher Education Qualification	2	1.3
International School Leaving Qualification	38	24.2
Not Disclosed	7	4.5
No Qualifications	3	1.9
Vocational	55	35.3
Total	156	100

The students were fairly evenly spread between two programmes of study; science (46.2%) and social science (53.8%). As students were progressing to a wide range of disciplines, the modules studied varied greatly, however, all students took the module Key Skills and Language for Higher Education which is where initial tests

were administered and teaching of research methods for the project occurred. There may be other differences between the two programmes of study e.g. those studying science modules may have more opportunity to explore ideas about the concepts of evidence, whilst those on the social science programme may be more disadvantaged by poor functional writing skills given the greater amount of essay writing required.

6.7 Description of the Durham Foundation Programme

This study was based on the Foundation Programme delivered by Durham

University. As outlined in Chapter 3, this is an example of model 6 where no A level qualifications are required for any student, whether mature or young and the teaching is delivered in a dedicated Centre. It is the only English-based Higher Education Institution using this model at the time of the study. Being in the top 10% of rankings, the university is a selecting institution and therefore the focus of the Programme was to widen rather than deepen participation, i.e. to give opportunities to a completely different cohort of students than the standard entrant.

6.7.1 Durham University as an Elite University

The Russell Group was established by 17 founder member universities in 1994. The group describes itself on its website as representing “24 leading UK universities which are committed to maintaining the very best research, an outstanding teaching and learning experience and unrivalled links with business and the public sector” (Russell Group, 2014). Durham University joined the group in 2012 along with three other institutions, bringing the total to 24 British Universities (Coughlan, 2012). The Russell Group is seen as research-intensive with the member institutions comprising only 15% of UK HEIs yet receiving three-quarters of university research grant and contract income in the UK in 2012/13 (Russell Group, 2014). In the research assessment exercise (RAE) 2008 the top 20 institutions as ranked by Research

Fortnight (2008) were all current Russell Group members although at the time Durham University and Queen Mary University of London had yet to join the group.

Durham University is positioned towards the top of the Russell Group for most aspects of ranking. For the Times Higher Education Supplement university rankings, the universities are ranked on a number of factors including student satisfaction, graduate prospects, entrance qualifications, degree result achieved, student/staff ratio, services and drop-out rate. Durham University is ranked 83rd in the world which is the 10th highest ranking in the Russell Group (THE, 2014), and 8th in the UK, which is the 5th highest ranking in the Russell Group (Parr, 2014). (Different factors were used in global and national rankings.) In terms of income, in 2012/13 it ranked fourth in the Russell Group (Morgan, 2014) despite being one of the smallest universities in the group with only 16,355 students which places it as the 20th in size.

6.7.2 The Foundation Programme

The Foundation Programme was first developed in 1997 and was designed for non-traditional students, particularly local, mature students, who did not have qualifications for direct access to Durham University degrees. In 2001 the Programme was extended to include international students whose home country's qualifications were insufficient for them to access Durham University degrees immediately. The Foundation Centre now runs a range of different Programmes preparing students for degrees in every Department in Durham University.

For each of the cohorts included in the study, the Foundation Centre academic year was divided into two teaching blocks. Teaching Block 1 ran from October to January comprising 10 weeks of teaching followed by an assessment week and Teaching Block 2 ran from January to June comprising 8 weeks of teaching and then a further 3 weeks following an Easter break. Students were required to achieve a total of 120

credits over the course of the year, split across the two teaching blocks, in order to progress to Year 1. Students had 18 hours of formal teaching time per week, made up of 6 compulsory sessions of lectures, workshops or practical sessions, over 21 weeks. The students were expected to complete assessments throughout the year, with most students either handing in a summative course work assignment or taking a summative in-class test by the fourth or fifth week of the start of the year.

Assessments continued through the year, including a test week in January and culminating in a two week examination period at the end of May. Students who failed the programme were given a second opportunity to pass the programme during the summer, with the final resit examination period occurring at the beginning of August.

Modules were taught by a combination of lectures, tutorials, seminars, workshops and practical laboratory or field sessions, if appropriate. Although the term 'lecture' is used, class sizes were usually kept to no more than 30 and the lectures were interactive, with students encouraged to question and contribute. Workshops were either part of the formal teaching or additional drop-in sessions for students to seek support. All modules utilised the on-line virtual learning environment, Durham University On-Line (DUO) to support students' learning which students could access in their own time to either prepare for classes in advance, or to catch up after a class.

As students progressed to most departments in the university, there was a large number (45) and range of modules for students to study, of which 18 were broadly characterised as social science modules and 26 were characterised as science modules. Only one module was generic and common to all students: Key Skills and Language for Higher Education. As one of the outcomes of the study was to investigate students' use of concepts of evidence, the difference in learning and teaching on other modules might have affected the results, particularly between those studying science modules and social science modules. Consequently the

students were assigned to either a science or social science programme of study depending on which types of modules predominated in their programme of study.

All classes were compulsory and students were advised at the start of the year that they were expected to attend lectures, seminars, workshops and laboratory sessions having completed the necessary preparation and to engage willingly in activities during these sessions. They were advised of the importance of notifying the Centre in the event of absence from the University during term time. Registers of attendance were taken and monitored weekly with unexplained absence investigated and students with high levels of non-attendance were given a disciplinary or supportive intervention. In a small number of cases, failure to improve led to students being required to leave the University. The percentage of attendance achieved by students formed part of the measure of the Conscientiousness Index.

Methods of assessment in the Foundation Centre varied between modules. Some modules were assessed entirely by coursework but others required a combination of coursework and a test or exam. All summative coursework and examinations were assessed using a standard set of assessment criteria. In addition to these general guidelines, specific criteria were produced pertaining to individual modules. Staff were expected to mark summative assignments and return them within two weeks, although the practice for formative assignments was to return work by the following class. The Foundation Programmes are pass/fail qualifications; progression depends on passing all modules at 50%. Students who failed to achieve a pass on the first attempt were allowed one resit attempt. The outline of the assessment criteria can be found in the appendix (Appendix A).

Students were advised of assignment submission deadline dates at the beginning of the year in an assessment diary and the hand-in day and time were kept constant through the year to prevent confusion. If the student felt that they had reasons for

late submission which were due to severe adverse circumstances beyond their control, they could apply for an extension. Students were advised that circumstances beyond their control did not include misreading the exam timetable or deadline date, oversleeping, pressure of work, or last-minute problems printing out or delivering coursework. If a student submitted work beyond the published deadline without having sought permission for an extension, the student did not receive a mark for the work and would be in a resit position. Records were kept as to whether extensions were requested and granted for late work or not. The percentage of assignments students handed in on time formed part of the measure of the Conscientiousness Index.

A number of modules had in-class tests or tasks as part of their assessment. If students did not sit this type of assessment at the set time for a good reason, they were offered one more opportunity to take the assessment at an alternative time. If they did not take this second opportunity, they were given a mark of zero for that part of the assessment.

6.8 Initial Data Collected for the 2010 cohort – Pre-Tests

In addition to the demographic data available before the students started on the programme, a set of tests were delivered to the students in order to assess some of their capabilities before experiencing any teaching on the programme. All the tests are available in the appendix.

Maths (Appendix B)

The Maths test was devised by Dr M.D. Dodd (personal communication) as part of a study into the approaches taken by mature students in solving maths problems. The test contained the types of problems that students were likely to face during the Foundation Programme and was graded in difficulty with the easier questions coming

first and gradually increasing in difficulty. Two scores were taken, the percentage of correct answers of the problems tackled and the percentage of the test completed. The averages of the two scores were then added to produce a Maths Ability score.

Critical Thinking (Appendix C)

The critical thinking test was a multiple choice test taken from OCR Critical Thinking AS level examination (permission received). As with the Maths test, the Critical Thinking Ability score was a combination of the percentage correct of those attempted and the percentage completed.

Test of Use of Concepts of Evidence (Appendix D)

Students' understanding of procedural ideas was assessed by means of a written test which targeted ideas about measurement, experimental design and data analysis. The evidence test was developed by Gott and Roberts (2008) to evaluate the understanding and application of the concepts of evidence in undergraduate Primary Education students.

Functional writing skills (Appendix C)

Students were asked to write a short essay using some journalistic sources. These essays were then graded for spelling, punctuation and grammar using a marking scheme developed in the English Language Centre based at Durham University to identify students' errors. The numbers and types of errors were collated and students graded 1 to 4: where grade 1 indicated students with very few or no mistakes; grade 2 indicated a student had made a number of mistakes, but that these did not impede understanding and the student would be likely to improve using the standard Key Skills module; grade 3 indicated a greater number of more serious mistakes and students were directed to the specialised support within the Key Skills module; and grade 4 indicated a student with severe problems requiring one-to-one support.

6.9 Final Data Collected – Post-Tests

Passing the programme

Methods of assessment in the Foundation Centre varied between modules, with some modules assessed entirely by coursework, others with a combination of coursework and a test or exam. All modules had a pass mark of 50%. Modules were worth either 10 or 20 credits and all students took 120 credits worth of modules. The marks for these modules were then averaged to give the final Foundation Average mark. To pass the Foundation Programme, students were required to pass all modules. This then constituted one outcome; whether a student passed the programme or not.

Students who did not pass the programme on the first attempt were offered a second opportunity to retake failed components. Data were collected on whether students had passed with or without resits, giving a second outcome of passing without resits.

Fail or Withdrawn

A record was kept of whether those students who did not pass the programme either withdrew before the end or failed to pass. Students withdraw for many reasons; some of them may be academic, with the recognition that the student is unlikely to pass, but there are frequently family responsibilities, financial and health reasons as well.

Doing well on the Programme

There has been a fairly consistent success rate of between 75 and 80% of students completing and passing the programme each year since 1997. A further outcome of interest was not just whether a student had passed the programme, but whether they had shown that they would be successful as an undergraduate student. A measure of 'doing well on the Foundation Programme' was therefore needed. The data from all students who had progressed to a degree and had the opportunity to complete the course i.e. the cohorts who commenced the programme between 2004 and 2007

were used to correlate performance in terms of Foundation Average with performance at degree level. The Foundation average means were compared with degree outcome using an ANOVA analysis which showed a significant correlation ($p=0.000$). The analysis showed that an average score of around 65% and above at Foundation level correlated with degree achievement of between a 2:1 classification and a 2:2 classification. Consequently, 65% was chosen as the point at which to describe a student as having done well on the programme.

Conscientiousness Index

Over the years of the Foundation Programme staff have recognised that attendance is closely correlated with success on the programme and in order to base this observation in evidence, analyses have been carried out which showed that students who attended fewer than 80% of classes were much less likely to pass the programme. The data on attendance percentage and percentage of timely submission of assignments were combined to create a Conscientiousness Index (CI). This form of measurement was informed by the work of the Medical Education Research Group at Durham University who have correlated a measure of Conscientiousness to perceptions of professionalism (McLachlan, Finn, & Macnaughton, 2009) and performance in both skills and knowledge exams (Kelly *et al.*, 2012).

The Conscientiousness Index (CI) is method which uses objective measures to produce a valid, reliable, cost effective scalar score of conscientiousness (McLachlan *et al.*, 2009). The measure of conscientiousness was originally developed at Durham University in a study of undergraduate medical students and the results have since been independently replicated at University College, Cork, with medical undergraduate students in their clinical years (Kelly *et al.*, 2012). The CI consists of points awarded for conscientious behaviours, such as attending compulsory sessions or timely submission of written work, so that by the end of the academic year the

students end up with an overall score: the CI score. It has been demonstrated that the CI score correlates strongly and significantly with professionalism, as determined independently by medical school staff, (Kelly *et al.*, 2012; McLachlan *et al.*, 2009) and by fellow students responding confidentially (McLachlan *et al.*, 2009) and that it corresponds with performance in both skills and knowledge exams (Kelly *et al.*, 2012), which offers an explanation of the association between professional behaviour in medicine and performance in medical school exams. Further research has shown that the measure is reliable (i.e. consistent across time) in such students (Chaytor, Spence, Armstrong, & McLachlan, 2012), which suggests that it is a stable trait, and that measures of conscientiousness as predicted by written Personal Qualities Assessments (Revised NEO Personality Inventory, NEO-PI-R) administered before entering a study programme correlate strongly with actual conscientiousness in performance once the programme is under way (unpublished data).

The attendance data for the Conscientiousness Index used in this study was calculated as a percentage of total possible attendance at the compulsory sessions of the programme. Tutors take registers at the beginning of each class, noting presence or absence, late arrivals and early departures. The registers are recorded on-line with a function to send messages centrally about any unusual situations e.g. a student needing to leave a class due to a phone call about a sick child. These registers are reviewed weekly to look for patterns of absence as part of the student monitoring process and tutors who have not completed their registers are reminded to keep them up-to-date.

For the assignment submission data, a record was kept of whether students' assignment submission was before or after the deadline given in the assessment diary. Extensions were recorded and also whether the students met the new extended deadline or not and these data were included in the analysis. The data

points for each student on assignments were calculated as a percentage of the total assignments that were submitted on time. The final CI score was calculated as the mean of the percentages derived for attendance and assignment submission.

For students registered from 2004 onwards, information on their attendance percentage and timely submission of assignments was recorded. There are 830 cases in this sample.

Test of Use of Concepts of Evidence

As well as looking at overall performance on the programme the study was also designed to see whether it was possible to identify students who were more likely to be prepared for the community of practice of a research-led university. As described in Chapter 5, the ability to use concepts of evidence was considered to be a measure of preparedness for degree-level study. This use of concepts of evidence test, which was administered at the beginning of the year as an input measure, was repeated at the end where it could also serve as an outcome measure (Appendix E).

The difference between the initial use of evidence test and the end of year use of evidence test was used to identify students who had improved in their understanding of evidence during the course of the year. Some students scored highly at the beginning and the end of the year, and consequently could not demonstrate improvement as the test did not increase in difficulty. These students were not included in the analysis of improvement. The rest of the students, however, were divided into those who had improved by more than one standard deviation and those who had not improved. Being an 'improver' was also used as an outcome.

Use of Concepts of Evidence in a Project

The Key Skills module included a research project where students had the opportunity to demonstrate their ability to apply concepts of evidence when using research methods i.e. in a 'real' situation. As outlined in the literature review, some

students are uncomfortable with the uncertainty inherent in research and may work to make the project 'fit' their idea of the right answer – working at the 'point view' (Buffler & Lubben, 2001) of understanding of evidence; they feel that the work should be linear and without problems and research will produce answers which are either right or wrong. The project provided an opportunity to look for evidence that students were embracing the 'set view' of uncertainty of evidence (Buffler & Lubben, 2001), the value of iterative design and the concept that there are no "right" answers (Gott & Roberts, 2008).

Consequently, the study needed to measure whether students were using concepts of evidence in a real situation of devising and conducting a small social science research project. All of the students in the 2010 cohort were given a research project to conduct which counted for 50% of the summative marks for the assessment for the Key Skills and Language for Higher Education module. The students were informed of the learning outcomes of the module which can be found in the appendix (Appendix F).

The students could choose one of five articles as the starting point of their project which covered the range of interests in terms of the degree progressions for the different students. The students were then required to critically analyse the article they had chosen, site the article in a relevant body of literature, develop a research question from the article, design and carry out a small research project to answer the question and then write up the project including a critical analysis of their own work. The students were required to ensure that the data they collected for their project was numerical to allow students to demonstrate an understanding of use of numerical evidence.

The project was marked using a standard mark scheme to provide a summative mark for the student. The project was then marked in several distinct sections as described in the table below for the purposes of this study.

Table 6.5 Project Mark Scheme

Assessed Section of the Project		Appropriateness for measuring use of concepts of evidence
Data Collection Data Interpretation Data Presentation	20%	Evidence of use of concepts of evidence, particularly the need for accuracy, reliability, data set collection and data analysis
Critical Analysis of Own Research	10%	Understanding of concepts of evidence – set or point approach – comfort with uncertainty of data
Method and Iterative Process	10%	Evidence of an iterative approach
Critical Analysis of the Article	20%	Assessing students' use of the evidence collected to construct an argument
Word Processed Graphs etc.	10%	Scores for this section were not used for this research
Powerpoint Presentation - video	10%	Scores for this section were not used for this research
Spelling Punctuation and Grammar Essay Flow Referencing	20%	Scores for this section were not used for this research

The marks awarded to students for the first four sections were collated, converted to a percentage and used as a measure of how well the student applied their understanding of the concepts of evidence in their project.

6.10 Testing Assumptions

As outlined at the beginning of the chapter, assumptions were made about the correlation between performance on a test of evidence, use of evidence in a project, performance on the Foundation Programme and degree outcome. In order to test these assumptions several statistical tests were conducted. As was described in an earlier section, an ANOVA analysis showed that there is significant ($p=0.000$) correlation between performance on the Foundation Programme and degree outcome. To test the rest of the assumptions, data from the 2010 cohort was used to conduct a bivariate correlation on the marks achieved in the final test of use of concepts of evidence, the mark for use of evidence in a project and the Foundation average mark. The outcome of this analysis is shown in Table 6.6.

Table 6.6 Correlations Between Evidence Exam Score, Project Evidence Score and Foundation Average Score

		Post Test of Use of Concepts of Evidence	Foundation Average	Evidence marks for project
Post Test of Use of Concepts of Evidence	Pearson Correlation	1	.592**	.322**
	Sig. (2-tailed)		.000	.000
	N	123	123	114
Foundation Average	Pearson Correlation	.592**	1	.596**
	Sig. (2-tailed)	.000		.000
	N	123	138	119
Evidence marks for project	Pearson Correlation	.322**	.596**	1
	Sig. (2-tailed)	.000	.000	
	N	114	119	119

** . Correlation is significant at the 0.01 level (2-tailed).

This shows that there is significant ($p=0.000$) correlation between all three variables, indicating that this was a reasonable assumption to make. It does not indicate causality, but it does show that, particularly in terms of the ability to use evidence in a project, there is a good predictive element to these assessments.

6.11 Ethics

Denscombe (2007) outlines the following three ethical points to be considered in the collection and analysis of data and dissemination of findings:

Respect the rights and dignity of those who are participating in the research project

Avoid any harm to the participants arising from their involvement in the research

Operate with honesty and integrity

(Denscombe, 2007, p. 141)

With the exception of the 2010 cohort, who had additional testing, all of the measurements formed part of the students' learning experiences and all student activity for this research was based on standard teaching and modules which had been validated through the usual procedures. The additional tests for the 2010 cohort which formed part of this research were also used to identify students who might benefit from additional support and this practice has continued in subsequent years as it has been recognised to be of benefit to the students.

The basic outline of the research was explained in a written summary and also verbally to students at the beginning of the year with an opportunity for students to ask questions about it. Students were asked to sign a consent form and they were given the opportunity to request that the data collected be used solely for educational purposes, not for research (Appendix G). Only one student requested this and their data were removed from the research. There was no need for any covert surveillance or any other form of deception. The data used was coded so that individuals were not immediately identifiable and the code was kept separately from the data. The research process followed data protection guidelines. Monitoring devices such as tape recorders were used openly and with the permission of the students. The research findings will be freely available to the participants following the completion of the thesis.

6.12 Summary

This chapter has attempted to demonstrate that the students on the Durham Foundation Programme are distinctly non-traditional and have characteristics of the underrepresented groups outlined in Chapter 2. The Programme is successful in progressing students to degree-level study, but as teaching and learning is a partnership between the learners and the educators, this study is focusing on the attributes, skills and experiences of the learners to explore whether some configurations of factors are more likely to lead to success than others.

Given the overlapping nature of characteristics describing underrepresented groups, as described in Chapter 2, traditional statistical methods would be unlikely to identify the nuances within the data. Consequently a case-led approach was thought to be more appropriate and the data was analysed using Crisp Set Qualitative Comparative Analysis (cQCA), which is described in more detail in Chapter 7.

CHAPTER 7: Qualitative Comparative Analysis

Introduction

This chapter presents a method of combining case-led data with a quantitative method, Qualitative Comparative Analysis (QCA), which was designed to be an approach that applies a way of analysing data to identify empirical patterns, as usually expected from quantitative approaches, but which keeps case-level detail more commonly found in qualitative methods. The theoretical position of this approach is discussed and then an outline of how the method works is given.

7.1 The Development of Qualitative Comparative Analysis

In 1987 Charles Ragin published *'The Comparative Method: moving beyond qualitative and quantitative strategies'* in which he outlined his description of a new method of analysing data, initially in the area of political science. As Markoff (1990) points out, this was quite an atypical proposal as until this point most methodological innovations were based on systematising existing methodologies. What Ragin proposed was to find a middle way between a traditional statistical quantitative approach as proposed by King, Keohane and Verba, and a qualitative non-numeric approach and to “advance an approach that transcends some of the limitations of conventional quantitative and qualitative research by extending and elaborating set-theoretic principals of social science research” (2008, p. 2).

Ragin makes the point that most forms of thinking involve comparison of some sort. It allows patterns to be discerned and cases described in terms of how well or not they conform to certain patterns. This may be using traditional statistical methods on quantitative data or by using theoretical criteria to describe ideal-typical cases from qualitative data. He quotes Lieberman (1985, p. 44) as saying that social research “in one form or other, is comparative research.” He describes the arguments made by

comparativists that it is inappropriate to specify the comparative method as applying to a narrow branch of social science and cites Smelser (1976) as claiming that the “continuity between comparative and non-comparative methods exists because their respective goals are identical - to explain social phenomena by establishing controls over the conditions and causes of variation”, and that ultimately “any technique that furthers the goal of explaining variation, according to this reasoning, is a comparative method” (in Ragin, 1987, p. 2).

While Ragin accepts this argument as valid, he proposes that there are distinctions to be made between comparativist and non-comparativist approaches and he describes one of the differences as being one of orientation leading to different methodological approaches. He describes comparative social science as being distinctive in that the qualitative method is dominant rather than the quantitative method, with the focus being on a holistic approach considering whole cases. He describes the tension between using quantitative or qualitative methods for comparative social science: a quantitative approach requires sufficient cases for traditional statistical methods and the resulting generalisation loses the connection to the realities of the complex situations; whereas the qualitative approach retains the complexity, but loses validity when attempting to extrapolate or generalise.

Ragin notes that the problem with multivariate statistical analysis is that it divides the cases into different variables which are then difficult to reconnect into the original, complex cases and that the assumptions required to simplify the data enough to make the approach possible can lead to confusion about causal effects and the ability to make interpretive statements. He describes how correlational analysis aggregates data in such a way that it obscures information on the connections between social phenomena while case-oriented approaches allow disaggregation. Because traditional statistical methods require that each independent variable is

treated as a discrete and isolated unit for analysis, if an analysis of combinations of variables is required, the methods needed are complex to apply and difficult to interpret. For case-orientated analysis, however, the configurations of conditions are the basis for the analysis. He proposes the method of formalising Qualitative Comparative Analysis using Boolean algebra which allows cases to remain whole and the different configurations bringing about the same outcome to be analysed. The advantage of the qualitative method is that it allows for the complexity caused by heterogeneous cases and retains the individual characteristics of the cases.

According to Grofman and Schneider (2009), Ragin describes QCA as a middle way between quantitative and qualitative approaches, and they suggest three different aims in the presentation of results of analysis of comparative social research. The first aim they describe as displaying relationships between variables in an understandable way; the second emphasising particular cases in causal interpretations; and the third articulating the match between the outcomes of the analysis and the original data. They propose that quantitative approaches focus on the first and the third, and that qualitative approaches focus on the second, whereas Qualitative Comparative Analysis which uses truth tables which are simplified to solution formulae using Boolean logic (this is described in more detail later in the chapter) allows for the integration of all three, while highlighting the second. The QCA solution formulae cover the first aim in that they describe equifinal relationships (i.e. different combinations of inputs can reach the same output); truth tables provide a logical structure to identify sets of conditions leading to the outcome under investigation; and the coverage and consistency parameters provide information on how well specific solution formulae fit the data.

The Qualitative Comparative Analysis method is concerned with complexity of causation and proposes that different combinations of conditions can result in the

same outcome. The various pathways to a particular outcome are analysed using Boolean logic, and causation is described in terms of necessary and sufficient conditions. “As Ragin... emphasised, while standard statistical techniques are good at distilling the net effect of single variables, QCA, by virtue of giving premium to causal complexity, seeks to detect different conjunctions of conditions (configurations) that all lead to the same outcome” (Grofman & Schneider, 2009, p. 663). The purpose of the analysis is to produce a parsimonious and logically consistent model of the different combinations of inputs that result in a particular output. This is achieved by constructing a truth table of all possible combinations of presence or absence of inputs leading to the output under investigation. The logically inconsistent inputs are disregarded using Boolean logic so that those conditions which must be satisfied for the outcome to be met are identified (Dixon-Woods, Agarwal, Jones, Young, & Sutton, 2005; Markoff, 1990; Ragin, 1987).

7.2 Rationale for Using QCA

The rationale for using QCA for this study is based on the number and type of cases that make up the research material. At the micro level of this research, each case is an individual student with a vast complexity of factors affecting their success on a particular educational programme (Byrne & Ragin, 2009). The number of cases is not large; although for some aspects of the study the number of cases used reaches 830, for the analysis of a single cohort, the number of cases drops to 156 and some of the subpopulations used are much smaller, for example the set of data for considering improving over the course of the year only contains 98 cases. QCA is particularly useful for analysing data sets of this size (Cooper, 2005; Legewie, 2013; Ragin, 1987).

When traditional statistical methods are used, cases are disaggregated into variables and distributions before they are analysed i.e. the process starts by simplifying the inputs leading to the outcome. Ragin notes the problem with this simplification process by saying that it “breaks cases into parts – variables- that are difficult to reassemble into wholes” (Ragin, 1987, p. x). This simplification of the causality can lead to relationships being masked in traditional statistical analyses as there may be other, confounding, variables and the process tends to lose interaction effects between variables (Ragin, 1987). For this study there are a wide range of factors to be considered such as age, sex, background, initial ability on tests etc., and there is evidence which indicates that they are likely to interact with each other; for example, non-traditional students from working class or ethnic backgrounds are likely to also be mature students (Egerton, 2000). Any attempt to disaggregate these factors carries the risk of losing the complexity and interactions between them.

Traditional statistical methods are based on finding results which can apply to a whole population, but with the understanding that rarely can a whole population be studied. Consequently a sample of the population is analysed and the results used to develop inferences about the whole population (Field, 2005). These inferences become more reliable in terms of significance the larger the sample size becomes and the validity of any generalisation from the findings reduces with smaller sample sizes. Case-based qualitative analysis, however, examines cases as a whole and allows the research to consider aspects including complexity, variety and distinctiveness, but attempts to use this approach with more than a very few cases can lead to the analysis disintegrating into “descriptive statements lacking any generalizability” (Ragin, 1987, p. xiii). The advantage of QCA is that it is a holistic approach which does not lose the case identity while also permitting the analysis of a larger number of cases so that generalisations can be made (Ragin, 1987, 2008; Rihoux & Ragin, 2009).

A further advantage of QCA is that it identifies patterns, as well as cases deviating from these patterns, using clear logical operations and because the case-based aspect of the data is retained, once the analysis is completed the lack of disaggregation means that it is possible to go back to the individual cases. It is possible to select cases which fit the pattern or deviate from it and collect further information to explore the reasons behind e.g. by interviewing individuals.

7.3 The process of QCA

Qualitative Comparative Analysis is a logical rather than a statistical approach to data analysis and it relies heavily on Boolean algebra. Boolean algebra is a logical approach developed from work originally introduced by George Boole (1815-1864) and is important in the fields of computer science and digital logic. There are several aspects which are utilised in social science analysis. There are two forms of QCA, crisp-set and fuzzy-set and for reasons explained further below, this study uses crisp-set.

7.3.1 Organisation of data for QCA into truth tables

The following fictitious example is used to help describe how the process of QCA works by considering which configurations of variables affect student attendance. The fictitious data contain information on whether students (n=145) attend all their classes, whether they live close to the university, whether they pay their own fees and whether they have family responsibilities.

Crisp-set QCA uses binary data i.e. 1 and 0 only, where 1 indicates the presence of a factor and 0 indicates its absence. In order to recode non-binary data into this system, a specific cut off point needs to be identified for continuous data.

Categorical data with more than two categories can be shown with a range of binary variables. In the case of family responsibilities, the membership of the groups is

likely to be either yes or no and simply dichotomised. For distance from the university, however, there would need to be a decision made about how far was considered “close”. It could be argued that fuzzy-set QCA provides a more discerning alternative to the dichotomisation necessary for crisp-set QCA. Fuzzy-set QCA (fsQCA) is an extension of crisp-set QCA (cQCA), developed out of the mathematical system of fuzzy-set theory (Zadeh, 1965) which allows for conditions varying by degree or level. In fsQCA there is the possibility to have partial membership of sets rather than being bound by the strict dichotomisation of cQCA where a case is either a full member or not a member at all of some set. However, when using fsQCA there is still a need to make a decision about the threshold value which reverts back to a simple dichotomy can give rise to greater levels of complexity and can produce logically paradoxical results (Cooper & Glaesser, 2011a) and although cQCA is also still being evaluated, it has been in use longer than fsQCA. A further consideration for using cQCA was that many of the factors investigated in this study were naturally dichotomous or categorical, such as sex, local/distant/overseas, programme of study etc..

These data are then presented in a truth table. A truth table is a way of representing the raw data into all the possible combinations of values of the independent variables. Each row of the truth table represents one logical combination of values and is then assigned a 1 or a 0 depending on whether a particular output is present. The truth table also gives the number of cases with that particular set of conditions and in some instances there may be rows with no cases. The fictitious data are presented below:

Table 7.1 Fictitious Example of Configurations Leading to the Outcome of Full Attendance

Row No.	Inputs			Output Full Attendance	Number of Cases
	A	B	C	F	
1	0	0	0	0	56
2	1	0	0	1	23
3	0	1	0	1	7
4	0	0	1	1	14
5	1	1	0	1	12
6	1	0	1	1	25
7	0	1	1	1	3
8	1	1	1	1	5

A = Live close by

B = Paying own fees

C = Lives alone

So, in row 5 for example, there are 12 students who live close by, who pay their own fees but don't live alone and achieve the outcome of full attendance.

7.3.2 Boolean Logic

The information then needs to be put into an expression using Boolean addition and Boolean multiplication. In Boolean algebra, a + sign indicates logical OR and indicates that more than one input can lead to a particular output. In the example above, inputs A and C can both lead to output F. This is expressed as $A + C = F$, showing that separately or together the inputs will lead to F. In this case the use of capital letters indicates a presence of the factor a lower case letter would indicate absence. If all of the possible inputs are considered, the truth table shown above produces an unreduced set of "sums of products".

$$F = Abc + aBc + abC + ABc + AbC + aBC + ABC$$

In the same way that Boolean addition is different from arithmetic addition, Boolean multiplication is not arithmetic, but a way of describing the terms of the sums of products. So that for the first sum-of-products, $A=1$, $B=0$ and $C=0$, the three terms are not multiplied, but rather indicate that the presence of A combined with the absence of B and C will bring about the output i.e. in the example above, students who lived close by, who did not pay their own fees and who did not live by themselves would have full attendance . Consequently Boolean multiplication is referred to as logical AND.

7.3.3 Minimisation

It is important to remember that the absence of an input provides as much substantive information about causal configurations as the presence of an input, so that while it might be tempting to focus on the presence of A – living close by leading to full attendance, in Boolean logic it is the combination of the presence of A in the absence of B and C which leads to success in these cases. Without further information, i.e. other combinations of cases and outcomes, this combinatorial complexity must be adhered to. The combinatorial logic means that the complexity of the solution is compounded, so a form of minimisation is needed to simplify the result. Essentially the minimisation rules say that if only one input is different in a pair of Boolean expressions, and still produce the same outcome, then the two different inputs can be considered irrelevant. This means, for example, that AbC combines with ABC to give AC . By continuing this process through the table, the final solution is reduced to

$$F = A + B + C$$

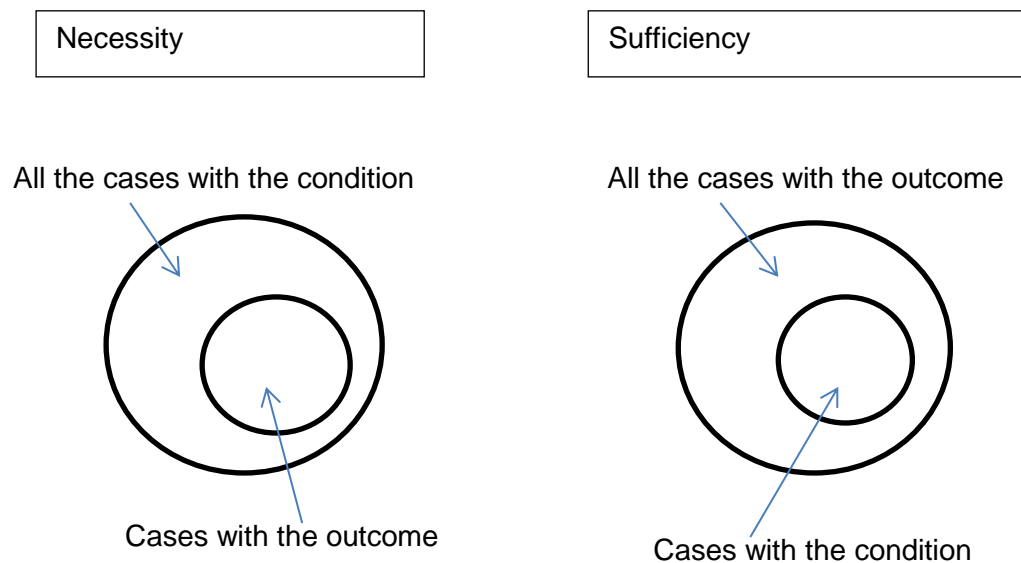
indicating that each of the inputs, living close by, paying own fees or living alone, separately or together, will lead to full attendance. While with this fictitious example it

is fairly easy to do by eye, with real datasets the configurations and combinations can become quite complex, and consequently software is used to perform this minimisation. The software also calculates the consistency and coverage for each solution, where consistency gives a value for the extent to which a solution is necessary or sufficient to provide the outcome and coverage gives the proportion of cases which a particular solution includes. Consistency is calculated as the proportion of cases with a given configuration of inputs which demonstrate the outcome so in table 7.1, row 5 if all 12 of the cases show the outcome of full attendance, that would give a consistency of 1 but if only 10 cases showed the outcome, the consistency would be 0.833. Coverage is calculated as the proportion of instances of an outcome for each configuration of inputs.

7.3.4 Necessary and Sufficient Conditions

Any condition which must be present to produce the outcome is considered necessary i.e. if the cases with the outcome form a subset of cases with the condition, that condition is considered necessary. Any condition that will always produce the outcome is considered sufficient i.e. if the cases with the condition form a subset of cases with the outcome, that condition is considered sufficient, Figure 7.1.

Figure 7.1 Venn Diagram to Illustrate Necessity and Sufficiency



A single cause of an outcome that must be present to produce the outcome is both necessary and sufficient, for example eating more calories than are expended will lead to obesity; the input of excess calories is necessary to produce obesity and it is also sufficient. This is a non-complex situation: a single input producing an output. Most situations are more complex where a condition may be sufficient without being necessary, where there are other conditions which can also produce the outcome; or necessary without being sufficient, where it does not produce the outcome by itself, but is present in all combinations of conditions producing the outcome. Considering the fictitious example given below, the outcome being analysed is success in an English module and the inputs being examined are being able to read and write English to GCSE standard, attending all the classes and reading all the set texts. The results are shown the truth table, Table 7.2.

Table 7.2 Fictitious Example of Configurations Leading to the Outcome of Success in an English Module

Row No.	Inputs			Output Success in English Module	Number of Cases
	A	B	C	S	
1	1	1	1	1	56
2	1	1	0	1	23
3	1	0	1	1	7
4	1	0	0	0	14
5	0	1	1	0	12
6	0	1	0	0	25
7	0	0	1	0	3
8	0	0	0	0	5

A Ability to read and write to GCSE standard

B Attendance at all classes

C Reading set texts

There are three configurations of factors which are sufficient for the outcome of success in the English Module; the first configuration includes all three factors considered, the second one is having the ability to read and write to GCSE standard as well as attending all the classes and the third configuration is being able to read and write to GCSE standard and having read the set texts. In this particular example, condition A – the ability to read and write to GCSE standard is a necessary condition, because all combinations of the conditions which have the outcome include the condition A, but it is not sufficient on its own, as there needs to be at least one other condition present, either class attendance or reading the set texts for a successful outcome.

7.3.5 Quasi-necessity and Quasi-sufficiency

This method of analysis was originally designed for use with small datasets, for example to consider socio-political inputs producing a variety of outputs in particular countries e.g. Ragin's hypothetical example (1987, p. 90) has a dataset of 22 countries. As a development of the method researchers have been applying it to much larger datasets, to examine, for example large data sets of individual people used to explore educational effects (Cooper, 2005; Cooper & Glaesser, 2011b; Glaesser & Cooper, 2011, 2012a, 2012b). In this thesis, the data set is fairly large (n=830 in some analyses) and is made up of individual people rather than countries. In this case relationships of perfect sufficiency or necessity are unlikely and the real world situation is much more likely to involve quasi-sufficiency or quasi-necessity.

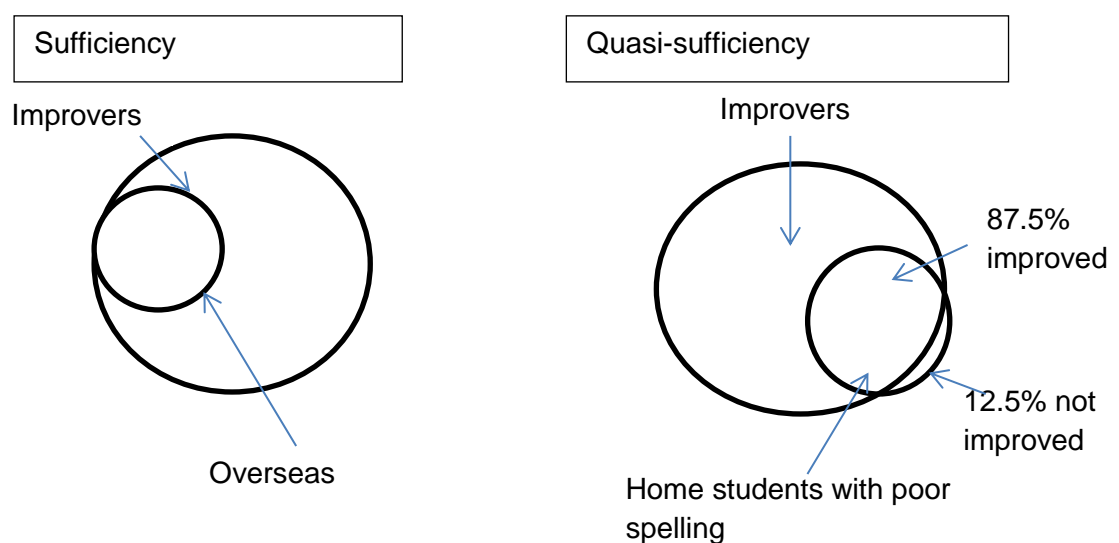
In the example below, Table 7.3, the output is whether the students had improved their performance on a test of use of concepts of evidence at the end of the year compared with the beginning of the year. The inputs that were considered were whether they were overseas students and whether their functional writing skills were poor or not at the beginning of the year. The truth table, Table 7.3, shows a 1 or a 0 in the "overseas" column to indicate whether the case involves an overseas student (1) or a home student (0). Likewise a 1 in the column "poor functional writing skills" indicates a low score whereas a 0 indicates that the case involves students with a higher score. The "number" column is the number of cases and the "consistency" column gives the proportion of cases which achieve the investigated outcome of "improve".

Table 7.3 Example Showing Configurations Leading to the Outcome of Improved Performance on a Test of Concepts of Evidence

Row no.	overseas	Poor functional writing skills	number	improve	consistency
1	1	0	23	1	1
2	1	1	8	1	1
3	0	1	44	1	0.875
4	0	0	13	0	0.333333

In the first two rows of the table there is complete consistency – all cases of overseas students in this truth table improved over the year. So the subset of overseas students is completely within the set of improvers. The subset of home students with poor functional writing skills is almost completely consistent, with 87.5% of them improving, but that means that 12.5% of them did not improve, but it is a high enough percentage to be considered quasi-sufficient. The fourth row indicates a subset of home students with good functional writing skills. In this group only a third of them showed improvement in the test of use of evidence, indicating that there were other factors affecting improvement in the test for this third of the groups.

Figure 7.2 Venn Diagrams to demonstrate Sufficiency and Quasi-sufficiency



7.3.6 Creating a solution to the truth table

This inclusion of quasi-sufficiency means that there needs to be an element of judgement in deciding which of the configurations of cases will be included in the minimisation process. Obviously any configurations with complete consistency with sufficiency i.e. a score of 1.000000 in the column consistency will be included, but if quasi-sufficient configurations are used a threshold needs to be set above which consistency is considered to be high enough to be included in the minimisation process. A commonly used threshold is 0.8 although any large discrepancies in consistencies between adjacent rows can be taken into account as long as the threshold is no lower than 0.7. As can be seen in the example below, Table 7.4, four configurations were considered to have a high enough consistency, with three at 1.0 and one at 0.823; whereas the fifth configuration with a consistency of 0.766, and those below, were not included. This decision is reflected in the 1s and 0s entered in the outcome column headed “improve”.

Table 7.4 Example Showing Configurations Leading to the Outcome of Improved Performance on a Test of Concepts of Evidence

Row no.	Overseas	Studying science	Poor spelling	number	improve	consistency
1	1	0	1	5	1	1.0
2	1	1	0	9	1	1.0
3	1	0	0	14	1	1.0
4	0	1	0	34	1	0.823529
5	0	0	0	30	0	0.766667
6	1	1	1	3	0	0.666667
7	0	0	1	2	0	0.5
8	0	1	1	1	0	0

The minimisation process using Boolean logic was then conducted using the first four rows of the truth Table to produce the solution to the truth table, shown below in Table 7.5, where raw coverage indicates the proportion of all cases with the outcome

produced by that pathway and unique coverage indicates the proportion of cases with the outcome that are only produced by that solution.

Table 7.5 Solution to the Truth Table

	Raw coverage	Unique coverage	Consistency
OVERSEAS*studying science	0.231707	0.231707	1.000000
STUDYING SCIENCE*poor spelling	0.451219	0.451220	0.860465

solution coverage: 0.682927

solution consistency: 0.903226

The convention used above indicates the presence of an input with uppercase letters and the absence of an input with lowercase letters. There are two pathways to the outcome of improving in the evidence test; being an overseas student and on the social science route (i.e. not studying science), or studying science without poor functional writing skills. As a student cannot be studying on both the science and social science routes, there is no overlap in coverage between these two pathways i.e. for each solution, raw coverage and unique coverage are the same. For the first pathway, the coverage shows that 23.2% of improvers are overseas students on the social science route and the consistency shows that all overseas students on the social science route are improvers i.e. being overseas and on the social science route are sufficient to produce the outcome of improving. For the second pathway, the coverage shows that 45.1% of improvers are on the science route and do not have poor functional writing skills and the consistency shows that 86.0% of science students without poor functional writing skills improve i.e. this combination of conditions is quasi-sufficient. The solution coverage shows that the two pathways combined include 68.2% of improvers and that 90.3% of cases with either of these two configurations will have the outcome of improving.

Summary

Qualitative Comparative Analysis is a relatively new method of analysing data in a way that applies a logical, empirical approach while retaining case-level detail. It has been developed from use with very small-N situations e.g. countries, to be applied to larger-N data sets e.g. individuals. In this thesis QCA will be applied to medium size data sets to retain the nuances within the data and allow for a multiple causal pathways to be identified which would not be possible with traditional statistical methods. The advantages and concerns regarding this method of analysis are considered in Chapter 9.

CHAPTER 8: Results

Introduction

Chapter 6 outlined the focus of the study which was to explore what configurations of factors affected the success of non-traditional students in a research-intensive university. Three possible categories of reasons for underrepresentation of non-traditional students have been suggested including inadequate initial education, recruitment bias, and alienation of the non-traditional student identity by the dominant learner culture in Higher Education. The factors considered to explore initial education included students' actual previous qualifications and also their ability on a range of initial tests. To explore alienation, the factors considered in the configurations included students' age, sex, conscientiousness and immersion in the university culture - as designated by being local, distant or overseas. As the students are on a specialist widening participation programme, factors around recruitment were not specifically explored.

This chapter outlines the results obtained from the study. In the first section the results obtained using Crisp Set Qualitative Comparative Analysis (cQCA) of the seven cohort dataset of students from 2004 to 2010 are presented to identify some of the broader factors affecting student success and achievement. This is using audit-style data which is recorded for every cohort, and includes input data such as age, sex, previous qualifications, origin, conscientiousness index and outcome data with respect to performance at Foundation and, for some cases, degree outcome. The next section then considers the more detailed factors collected in the study of the 2010 cohort, which includes input data for initial abilities across a range of skills and output data in terms of demonstrating an ability to use concepts of evidence as evidence of preparedness for study at a research-intensive university.

8.1 Analysis of Broad Factors Affecting Success

The table below summarises the input and output data used in this analysis with an explanation of the abbreviations used.

Table 8.1 Summary of the abbreviations used for the data

Inputs	Abbreviation	Description see Chapter 6 for more detail
Age	OVER25	Set of students aged 25 and over – absence indicates the set of students aged under 25
	OVER21	Set of students aged 21 and over – absence indicates the set of students aged under 21
Programme of Study	SCIENCE	Set of students studying predominantly Science-based modules
	SOCSCI	Set of students studying predominantly Social Science-based modules
Sex	FEMALE	Set of students who are female - absence indicates the set of students who are male
Conscientiousness Index	CI80	Set of students with a conscientiousness index over 80%
Previous Qualification	TRADQUAL	Set of home students who have studied to at least AS level previously
	OTHERQUAL	Set of home students with any other previous qualification including vocational, GCSE or no qualifications
	ISLQ	Set of students with International School Leavers' Qualification
Origin	INT	Set of students who come from outside the UK
	DISTANT	Set of home students from outside the North East of England
	LOCAL	Set of home students from the North East of England determined by postcode data
Foundation Average	FA65	Set of students who achieve a final Foundation Average mark of 65% or greater
Outcomes		
Passing the Programme	PASSALL	Passing the Foundation Programme including after resits and those who

		passed after concessionary withdrawal
Doing well on the Programme	FA65	Achieving a final Foundation Average mark of 65% or greater
Achieving an Honours Degree	HONSDEG	Achieving any honours degree
Achieving a Good Honours Degree	GOODHONS	Achieving a first or 2.1 degree classification from Durham
Having a high conscientiousness index	CI80	Having a conscientiousness index over 80%
Withdrawn	WD	Leaving the Foundation programme before completion

For the input AGE, students were divided into three groups, under 21 years of age, between 21 and 24 years of age and 25 years of age or older. This grouping was based on observations by Foundation staff that young male students between the ages of 21 and 25 tend to have poorer engagement with the Programme compared with younger or older men. By using these age groupings I was able to explore whether there was any evidence to back up these observations.

8.1.1 Analysis of Passing the Programme

The analyses for these data were based on the seven cohort dataset using data from students registered between 2004 and 2010, which comprised 830 cases. The first set of analyses were conducted on a subset of 752 of these cases, only including those students who had completed the whole year and achieved either a pass or a fail, and excluding those students who had withdrawn during the year. The reason for excluding withdrawn students is because the data on the conscientious index for those students who had withdrawn were unreliable as official withdrawal dates and actual withdrawal dates were often different. The conditions analysed were those which were associated with the outcome of passing the Foundation Programme i.e. the basic level required for a student to progress to year 1 of a degree within the

institution. The conditions were age, with students being in the set of mature students when aged 25 or over; programme of study, where students studying for science-based progressions are in the science set; sex; and high conscientiousness, with the threshold for being included in the set for high conscientiousness index based on a score of 80% or more. In initial analyses additional inputs were considered which included whether students had achieved a traditional qualification (i.e. had studied up to at least AS level), were international or were local but as they did not form part of the configurations for the outcome of passing the programme, they have been left out of this analysis.

The truth table for this analysis is presented below, Table 8.2. As the rows are ordered in descending order of consistency with sufficiency, those rows near the top of the table contain the greater proportion of cases which achieve the outcome of passing the Foundation Programme. It is interesting to note that the configurations which contain a high conscientiousness (rows 1-7) are at the top of the table and that those at the bottom of the table, (rows 11-16) with the lower levels of consistency with sufficiency do not contain high conscientiousness in their configurations.

Table 8.2 Truth Table for Outcome Passing the Foundation Programme

Row No.	OVER25	SCI	FEMALE	CI80	Number	PASSALL	Consistency
1	0	1	1	1	50	1	0.98
2	1	1	1	1	79	1	0.974684
3	1	0	1	1	48	1	0.958333
4	1	1	0	1	43	1	0.930233
5	1	0	0	1	27	1	0.925926
6	0	1	0	1	80	1	0.925
7	0	0	1	1	92	1	0.923913
8	1	1	1	0	12	1	0.916667
9	1	0	1	0	22	1	0.909091
10	0	0	0	1	90	1	0.888889

11	0	0	1	0	52	0	0.826923
12	0	1	0	0	33	0	0.787879
13	0	1	1	0	18	0	0.777778
14	0	0	0	0	81	0	0.604938
15	1	0	0	0	16	0	0.5625
16	1	1	0	0	9	0	0.555556

The Boolean solution for this truth table is shown below, Table 8.3. The truth table column "PASSALL" indicates with 1s those cases which are considered to have achieved a sufficiently high level of consistency to have met the outcome. This was produced by choosing 0.85 as the minimal threshold for the proportion of cases achieving the outcome of passing the Foundation Programme. This is quite a high threshold, but this is justified by the large change in consistencies between rows 10 and 11. The solution therefore contains ten configurations, however, the Boolean solution shown in Table 8.3 minimises these into an overall solution containing two quasi-sufficient pathways. The first is simply to have high conscientiousness and the second is a combination of being female and mature.

In these data where a factor code is written in capitals, it indicates that it is required to be present in the pathway leading to the outcome. If the factor code is written in lower case that indicates that the pathway leading to the outcome requires that the factor is not present.

Table 8.3 QCA Output Passing the Foundation Programme

	Raw Coverage	Unique coverage	Consistency
CI80	0.728943	0.540582	0.935167
OVER25*FEMALE	0.235835	0.047473	0.956522

solution coverage: 0.776417

solution consistency: 0.933702

For both pathways, the raw and unique coverage is different, because there will be some overlap between these two elements i.e. there will be mature females who have a high conscientiousness, but both values are considerably higher for conscientiousness, showing that it is found in more of the configurations than being mature and female. The solution of being mature and female has a low unique coverage indicating that a large proportion of the mature women in the solution also have a high conscientiousness index. The solution shows that having high conscientiousness or being mature and female is quasi-sufficient to achieve the outcome of passing the Foundation Programme.

Given the high coverage and consistency with sufficiency of the single factor, a high conscientiousness index, an analysis of necessary conditions was conducted. Recall that a “cause is defined as necessary if it must be present for a certain outcome to occur” (Ragin, 1987, p. 99). Considering that there is more than one pathway and the second pathway does not include the factor of a high conscientiousness index, there is only potential for quasi-necessity, however, measuring quasi-necessity for having a high conscientiousness index is a useful measure of the relative importance of factors to produce outcomes. As can be seen from Table 8.4 conscientiousness is approaching necessity at 0.73.

Table 8.4 Analysis of Necessary Conditions for the outcome variable: Passall

Conditions tested	Consistency	Coverage
CI80	0.728943	0.935167

For the outcome of passing the Programme, a high CI score is both quasi sufficient and quasi necessary and the other quasi sufficient pathway is to be female and mature.

8.1.2 Analysis of doing well on the programme

Following the analysis of what causal factors lead to the outcome of passing the programme, the next analysis considers what configurations are associated with doing well on the programme. As described in Chapter 6, there is a significant correlation between achievement on the Foundation Programme and subsequent success at degree level. The level of a Foundation average of 65% or more has been chosen as the measurement of “doing well” on the programme as this score correlates with degree achievement of between a 2:1 classification and a 2:2 classification. Since there were more factors being considered there were a greater number of configurations. Student age was included again, as was programme of study and a high Conscientiousness Index score. In addition to these factors were whether students had achieved a traditional qualification (i.e. had studied up to at least AS level), were international or were local. Students were not able to be both local and international and those cases where neither of these were true indicates that the student was a home student but not local to the area, i.e. distant. The results are displayed in the truth table below, Table 8.5. Not all the possible rows are shown because some of the factors are mutually exclusive, e.g. a student could not be both international and local. The software does not recognise this, however, and produces all the combinations including combinations of student origin. Consequently any such rows would have no cases in them and these have been removed by hand. As with the truth table for passing the Foundation Programme, the rows with the highest consistency with doing well all contain the factor of high conscientiousness.

Table 8.5 Truth Table for the Outcome Doing Well on the Foundation Programme

Row No.	OVER21	SCI	TRADQUAL	INT	LOCAL	CI80	number	FA65	consistency
1	0	1	1	0	1	1	12	1	1

2	1	1	0	1	1	1	1	1	1
3	1	0	1	1	0	0	1	1	1
4	1	0	1	0	0	1	10	1	0.9
5	0	1	0	1	0	1	45	1	0.8
6	1	1	1	0	0	1	14	0	0.785714
7	1	1	1	0	1	1	26	0	0.769231
8	1	1	1	0	1	0	4	0	0.75
9	1	1	0	1	0	1	4	0	0.75
10	0	1	1	0	0	1	11	0	0.636364
11	1	1	0	0	1	1	102	0	0.617647
12	0	0	0	0	0	1	5	0	0.6
13	0	0	0	1	0	1	101	0	0.594059
14	1	1	0	0	0	1	21	0	0.571429
15	0	1	0	0	1	1	7	0	0.571429
16	1	0	1	0	1	1	15	0	0.533333
17	1	0	0	1	1	1	2	0	0.5
18	1	1	1	0	0	0	6	0	0.5
19	1	0	0	0	0	1	15	0	0.466667
20	0	1	0	1	0	0	13	0	0.461538
21	0	1	0	0	0	1	7	0	0.428571
22	0	1	1	0	1	0	7	0	0.428571
23	0	0	1	0	1	1	5	0	0.4
24	1	0	1	0	0	0	5	0	0.4
25	0	0	1	0	0	1	6	0	0.333333
26	0	0	1	0	1	0	6	0	0.333333
27	0	0	0	1	0	0	46	0	0.326087
28	0	0	0	0	0	0	11	0	0.272727
29	1	1	0	0	1	0	22	0	0.272727
30	1	0	0	1	0	1	26	0	0.269231
31	1	0	0	0	1	1	67	0	0.268657
32	1	1	0	0	0	0	8	0	0.25
33	1	0	1	0	1	0	13	0	0.230769

34	1	0	0	0	0	0	13	0	0.230769
35	0	0	0	0	1	1	5	0	0.2
36	0	0	0	0	1	0	8	0	0.125
37	1	0	0	0	1	0	45	0	0.111111
38	0	0	1	0	0	0	15	0	0.066667
39	1	1	0	1	0	0	3	0	0
40	0	1	0	0	1	0	1	0	0
41	0	1	1	0	0	0	1	0	0
42	1	0	0	1	0	0	8	0	0
43	0	1	0	0	0	0	7	0	0

The threshold level for achieving the outcome of doing well on the programme was set at 0.8 and rows with fewer than 5 cases were excluded in the minimisation process, giving three pathways to the outcome of doing well on the Foundation Programme, shown in the Boolean solution below, Table 8.6.

Table 8.6 QCA Output for the Outcome Doing Well on the Foundation Programme

	Raw Coverage	Unique coverage	Consistency
over21*SCI*TRADQUAL*int*LOCAL*CI80	0.034384	0.034384	1.000000
over21*SCI*tradqual*INT*local*CI80	0.025788	0.025788	0.900000
OVER21*sci*TRADQUAL*int*local*CI80	0.103152	0.103152	0.800000

solution coverage: 0.163324

solution consistency: 0.850746

This can be simplified by recognising that a student cannot be both international and local, that a student who is neither must be distant, and that international students cannot have traditional qualifications, Table 8.7. All three pathways include high conscientiousness. Two of the pathways also include being young and studying on the science programme, with one of the pathways being for international students

and the other for local students who have studied to at least AS level; whereas the third pathway is for mature, home students, not from the local area, who have studied to at least AS level on the social science programme.

Table 8.7 Simplified QCA Output for the Outcome Doing Well on the Foundation Programme

	Raw Coverage	Unique coverage	Consistency
over21*SCI*TRADQUAL*LOCAL*CI80	0.034384	0.034384	1.000000
over21*SCI*INT*CI80	0.025788	0.025788	0.900000
OVER21*sci*TRADQUAL*DISTANT*CI80	0.103152	0.103152	0.800000

solution coverage: 0.163324

solution consistency: 0.850746

As all three of the pathways include high conscientiousness as part of the configuration and consequently an analysis of necessity was conducted. As can be seen below, Table 8.8, the factor of high conscientiousness is approaching necessity at 0.83. The coverage at 0.57 is lower than the coverage calculated in the analysis of necessary conditions for the outcome variable of passing the foundation at 0.93, but this is to be expected as many more students pass the programme than do well on the programme.

Table 8.8 Analysis of Necessary Conditions for the outcome variable: doing well on the programme

Conditions tested	Consistency	Coverage
CI80	0.830946	0.569745

8.1.3 Analysis of conditions leading to the outcome of Honours Degree

As the point of a Foundation Programme is to prepare students for study at degree level, the next analysis was to see what configurations of factors lead to the outcome of achieving an honours degree. The subset of cases used was composed of data on 233 students registered between 2004 and 2007 who progressed to degrees at Durham University. Students who progressed from 2008 onwards had not had time to complete their degrees when these data were collected. In this first analysis, age, sex, and high conscientiousness were included as factors. The high conscientiousness index only referred to that measured while the student was studying at Foundation level; there are no data collected on CI for subsequent years. A new factor was included this time which was doing well on the Foundation Programme, based on a Foundation average of 65% or over, Table 8.8.

Table 8.9 Truth table for the outcome Achieving an Honours Degree

Row No.	OVER21	FEMALE	FA65	CI80	Number	HONSDEG	Consistency
1	1	1	1	0	2	1	1
2	0	0	1	0	3	1	1
3	0	1	0	1	15	1	0.933333
4	1	0	1	1	15	1	0.866667
5	1	1	1	1	50	1	0.86
6	0	1	1	1	25	1	0.84
7	0	0	0	1	10	1	0.8
8	0	1	1	0	5	1	0.8
9	0	0	1	1	25	0	0.76
10	1	1	0	1	31	0	0.677419
11	1	0	0	1	12	0	0.666667
12	1	0	0	0	8	0	0.625
13	0	1	0	0	10	0	0.6
14	1	0	1	0	2	0	0.5
15	1	1	0	0	11	0	0.454545
16	0	0	0	0	9	0	0.444444

The threshold level for achieving the outcome of an honours degree was set at 0.80 and rows with fewer than 5 cases were excluded to produce the Boolean solution shown below, Table 8.10. There are two pathways which are quasi-sufficient for

achieving an honours degree; young, female students with a high conscientiousness index and mature students who do well on the Foundation Programme and who have a high conscientiousness index.

Table 8.10 QCA Output for the Outcome Achieving an Honours Degree

	Raw Coverage	Unique Coverage	Consistency
over21*FEMALE*CI80	0.197740	0.197740	0.875000
OVER21*FA65*CI80	0.316384	0.316384	0.861538

solution coverage: 0.514124

solution consistency: 0.866667

The analysis was then repeated combining the factors of previous qualification with conscientiousness index and Foundation Programme performance. The mutually exclusive rows have been excluded e.g. combinations of all three types of qualification as students can only be in one of the three groups for qualification,

Table 8.11.

Table 8.11 Truth table for the Outcome Achieving an Honours Degree

Row No.	OVER21	FEMALE	TRAD QUAL	ISLQ	OTHER QUAL	FA65	CI80	number	HONS DEG	consistency
1	0	0	1	0	0	1	1	2	1	1
2	0	0	1	0	0	0	1	2	1	1
3	0	0	0	1	0	1	0	2	1	1
4	1	1	1	0	0	1	0	2	1	1
5	1	0	1	0	0	1	1	3	1	1
6	1	1	0	1	0	1	1	1	1	1
7	0	1	1	0	0	0	1	3	1	1
8	0	1	1	0	0	1	1	8	1	1
9	1	1	0	1	0	0	1	1	1	1
10	1	0	0	0	1	1	1	8	1	1
11	0	1	0	0	1	0	1	4	1	1
12	1	0	1	0	0	0	1	1	1	1
13	0	0	1	0	0	1	0	1	1	1
14	1	0	0	1	0	0	1	3	1	1
15	0	1	0	0	1	1	0	1	1	1
16	0	0	0	0	1	1	1	3	1	1
17	1	1	1	0	0	1	1	14	1	0.928571
18	0	1	0	1	0	0	1	8	1	0.875

19	0	0	0	1	0	0	1	6	1	0.833333
20	1	1	0	0	1	1	1	35	1	0.828571
21	0	1	0	1	0	1	1	14	0	0.785714
22	0	1	0	0	1	0	0	4	0	0.75
23	0	1	0	1	0	1	0	4	0	0.75
24	1	0	0	0	1	0	0	4	0	0.75
25	0	0	0	1	0	1	1	20	0	0.7
26	1	1	0	0	1	0	1	28	0	0.678571
27	1	0	1	0	0	0	0	3	0	0.666667
28	0	1	0	0	1	1	1	3	0	0.666667
29	0	0	0	0	1	0	0	3	0	0.666667
30	0	0	1	0	0	0	0	2	0	0.5
31	0	1	0	1	0	0	0	2	0	0.5
32	1	0	0	0	1	1	0	2	0	0.5
33	1	1	1	0	0	0	1	2	0	0.5
34	0	0	0	0	1	0	1	2	0	0.5
35	1	0	0	1	0	1	1	4	0	0.5
36	0	1	1	0	0	0	0	4	0	0.5
37	1	0	0	0	1	0	1	8	0	0.5
38	1	1	0	0	1	0	0	11	0	0.454545
39	0	0	0	1	0	0	0	4	0	0.25
40	0	0	0	0	1	1	0	0	0	
41	0	1	1	0	0	1	0	0	0	
42	1	0	0	1	0	1	0	0	0	
43	1	0	1	0	0	1	0	0	0	
44	1	0	0	1	0	0	0	1	0	
45	1	1	0	0	1	1	0	0	0	
46	1	1	0	1	0	0	0	0	0	
47	1	1	0	1	0	1	0	0	0	
48	1	1	1	0	0	0	0	0	0	

The threshold level for achieving the outcome of an honours degree was set at 0.80 and rows with fewer than 5 cases were excluded to produce the Boolean solution shown below, Table 8.12. There are three pathways which are quasi-sufficient for the outcome of achieving an honours degree; young, international students with a high conscientiousness index, female students who have studied to AS level before, performed well on the Foundation Programme and with a high conscientiousness index, and mature students with non-traditional qualifications who performed well on the Foundation Programme with a high conscientiousness index.

Table 8.12 QCA Output for the Outcome Achieving an Honours Degree

	Raw Coverage	Unique Coverage	Consistency
over21*ISLQ *CI80	0.067797	0.067797	0.857143
FEMALE*TRADQUAL *FA65*CI80	0.118644	0.118644	0.954545
OVER21*OTHERQUAL*FA65*CI80	0.209040	0.209040	0.860465

solution coverage: 0.395480

solution consistency: 0.886076

All three solutions have the element of high conscientiousness as part of their configurations and this is the only element that is found in all four pathways.

Consequently an analysis of necessary conditions was conducted for high conscientiousness for the outcome of achieving an honours degree. This analysis shows that high conscientiousness is approaching necessity for the outcome of achieving an honours degree at 0.83, Table 8.13.

Table 8.13 Analysis of Necessary Conditions for the outcome variable: honsdeg

Conditions tested	Consistency	Coverage
CI80	0.830508	0.803279

Considering that doing well on the Foundation programme is strongly correlated with a good degree and that this factor was an element in three of the pathways, this was also analysed for necessity for the outcome of an honours degree. As can be seen in the table below, Table 8.14, doing well on the foundation programme is not a necessary condition and that other factors can influence whether a student achieves an honours degree.

Table 8.14 Analysis of Necessary Conditions for the outcome variable: honsdeg

Conditions tested	Consistency	Coverage
FA65	0.598870	0.834646

8.1.4 Analysis of conditions leading to the outcome of a Good Honours Degree

Many universities and employers use good honours degrees as a key performance indicator, so as well as whether students achieved an honours degree, the outcome of achieving either a first class or a 2:1 degree was analysed to elucidate whether any configurations of factors were sufficient for that outcome, Table 8.15.

Table 8.15 Truth Table for the Outcome Achieving a Good Honours Degree

Row No.	OVER21	FEMALE	TRAD QUAL	ISLQ	OTHER QUAL	FA65	CI80	number	GOOD HONS	consistency
1	1	1	0	1	0	1	1	1	1	1
2	0	1	0	0	1	1	0	1	1	1
3	0	0	1	0	0	1	0	1	1	1
4	1	1	1	0	0	1	1	14	1	0.857143
5	0	1	1	0	0	1	1	8	0	0.75
6	0	0	0	0	1	1	1	3	0	0.666667
7	1	0	1	0	0	1	1	3	0	0.666667
8	1	1	0	0	1	1	1	35	0	0.6
9	1	0	0	1	0	1	1	4	0	0.5
10	1	0	0	0	1	1	1	8	0	0.5
11	0	1	0	1	0	0	0	2	0	0.5
12	0	0	1	0	0	1	1	2	0	0.5
13	0	1	0	1	0	1	1	14	0	0.428571
14	0	0	0	1	0	1	1	20	0	0.4
15	0	1	0	0	1	1	1	3	0	0.333333
16	0	0	0	0	1	0	0	3	0	0.333333
17	0	1	1	0	0	0	1	3	0	0.333333
18	0	0	0	1	0	0	1	6	0	0.333333
19	0	1	0	0	1	0	1	4	0	0.25
20	0	1	0	1	0	1	0	4	0	0.25
21	1	1	0	0	1	0	1	28	0	0.142857
22	1	0	0	0	1	0	1	8	0	0.125
23	0	1	0	1	0	0	1	8	0	0.125
24	1	1	0	0	1	0	0	11	0	0.090909
25	1	0	1	0	0	0	0	3	0	0
26	1	0	0	1	0	0	1	3	0	0
27	0	0	0	1	0	1	0	2	0	0
28	0	0	1	0	0	0	0	2	0	0
29	0	0	1	0	0	0	1	2	0	0
30	0	0	0	1	0	0	0	4	0	0
31	0	0	0	0	1	0	1	2	0	0
32	0	1	0	0	1	0	0	4	0	0

33	1	1	1	0	0	0	1	2	0	0
34	1	1	1	0	0	1	0	2	0	0
35	0	1	1	0	0	0	0	4	0	0
36	1	0	0	0	1	0	0	4	0	0
37	1	0	0	1	0	0	0	1	0	0
38	1	0	1	0	0	0	1	1	0	0
39	1	1	0	1	0	0	1	1	0	0
40	1	0	0	0	1	1	0	2	0	0
41	0	0	0	0	1	1	0	0	0	
42	0	1	1	0	0	1	0	0	0	
43	1	0	0	1	0	1	0	0	0	
44	1	0	1	0	0	1	0	0	0	
45	1	1	0	0	1	1	0	0	0	
46	1	1	0	1	0	0	0	0	0	
47	1	1	0	1	0	1	0	0	0	
48	1	1	1	0	0	0	0	0	0	

The truth table was minimised by setting the threshold at 0.8 and excluding rows with fewer than 5 cases and the result only showed one pathway to achieving a good honours degree, giving the simple solution below, Table 8.16. In this solution there is only one configuration of factors which are quasi sufficient for the outcome of achieving a good honours degree, which is being female, having studied to at least AS level, having done well on the Foundation Programme and having a high Conscientiousness Index score.

Table 8.16 QCA Output for the Outcome Achieving a Good Honours Degree

	Raw Coverage	Unique coverage	Consistency
FEMALE*TRADQUAL*FA65*CI80	0.219512	0.219512	0.818182

In order to investigate whether any of these conditions are necessary for the outcome of achieving a good honours degree, an analysis of necessary conditions was conducted for all four factors. The analysis showed that having a high conscientiousness index is approaching necessity for the outcome of achieving a good honours degree at 0.93 and that a good performance on the Foundation

Programme is also a quasi-necessary condition at 0.84, Table 8.17. Traditional qualifications are not a necessary condition for the outcome of achieving a good honours degree at 0.28. At 0.71, being female is just on the borderline of being considered necessary, which may be because of the correlation between being female and having a high Conscientiousness Index score.

Table 8.17 Analysis of Necessary Conditions for the Outcome Achieving a Good Honours Degree

Conditions tested	Consistency	Coverage
CI80	0.926829	0.415301
FA65	0.841463	0.543307
FEMALE	0.707317	0.389262
TRADQUAL	0.280488	0.489362

8.1.5 Analysis of High Conscientiousness

Given that all four outcome variables considered so far have shown that high conscientiousness is quasi-necessary to some level in each of the analyses, this variable is now considered as an outcome in order to elucidate which configurations of factors produce a high conscientiousness index as an outcome. Previous studies on conscientiousness measured using the NEO-PIR method (Cobb-Clark & Schurer, 2012; Digman, 1990; Klimstra et al., 2012; Poropat, 2009) have suggested that conscientiousness increases with age and that females tend to have higher conscientiousness than males. I also speculated that the programme of study might affect attendance behaviours as the more science-based programmes of study tend to build strongly on previous work and students may feel that they are less able to catch up if they miss classes than students on the social science programmes. Origin is also a factor which may affect conscientiousness index behaviours as those students who have family responsibilities may find it harder to engage with the requirements of the course. The factors investigated in this analysis therefore included age, sex, programme of study and origin as shown in the truth table below, Table 8.18.

Table 8.18 Truth table for the Outcome High Conscientiousness Index

Row no.	OVER25	SCI	FEMALE	LOCAL	number	CI80	consistency
1	1	0	1	0	9	1	0.888889
2	1	1	1	0	8	1	0.875
3	1	1	1	1	83	1	0.86747
4	1	1	0	1	35	1	0.857143
5	1	0	0	0	14	0	0.785714
6	1	1	0	0	17	0	0.764706
7	0	1	1	1	38	0	0.736842
8	0	1	1	0	30	0	0.733333
9	0	1	0	0	87	0	0.712644
10	0	1	0	1	26	0	0.692308
11	1	0	1	1	61	0	0.655738
12	0	0	1	0	106	0	0.650943
13	0	0	1	1	38	0	0.605263
14	0	0	0	0	133	0	0.56391
15	1	0	0	1	29	0	0.551724
16	0	0	0	1	38	0	0.394737

To construct the Boolean solution, the threshold of 0.8 was used which gave two pathways as being consistent with sufficiency, Table 8.19. Being 25 or over, female and not local is a quasi-sufficient configuration to achieve the outcome of having high conscientiousness; as is being 25 or over, local and on the science programme.

Table 8.19 QCA Output for the Outcome High Conscientiousness Index

	Raw Coverage	Unique coverage	Consistency
OVER25*FEMALE*local	0.029470	0.029470	0.882353
OVER25*SCI*LOCAL	0.200393	0.200393	0.864407

solution coverage: 0.229862

solution consistency: 0.866667

Given the appearance of being 25 or over in both solutions, this factor variable was analysed for necessity, but as can be seen from the table below, Table 8.20, it is not a necessary condition for high conscientiousness.

**Table 8.20 Analysis of Necessary Conditions for the outcome variable:
Conscientiousness Index 80 or over**

Conditions tested	Consistency	Coverage
OVER25	0.387033	0.769531

Looking at the bottom of the truth table, Table 8.18, it appears that the observation by Foundation Programme staff that young male students between the ages of 21 and 25 are the least likely to engage with the programme is compatible with the evidence presented here. In order to explore this further, an analysis of necessary conditions was carried out on the outcome of not having high conscientiousness. The conditions tested were one of three age groups; under 21; early 20's (21 to 24); and 25 and over; for both males and females, Table 8.21. Although none of the configurations lead to a level that would be considered quasi-necessary, the highest consistency with not having a conscientiousness index of 80% or above was for males in their early 20's at 0.68.

**Table 8.21 Analysis of Necessary Conditions for the Outcome Low
Conscientiousness**

Conditions tested	Percentage of cases % (no. cases)	Consistency	Coverage
Young males	22.65 (188)	0.579365	0.388298
Young female	17.59 (146)	0.420635	0.363014
Early 20's male	14.58 (121)	0.684783	0.520661
Early 20's female	9.88 (82)	0.315217	0.353659
Mature male	14.21 (118)	0.511364	0.381356
Mature female	21.08 (175)	0.488636	0.245714

8.1.6 Analysis of Withdrawal from the Programme

The reasons students give for withdrawing from the programme are varied. A small number of students are withdrawn by the University for not meeting their academic commitments. Although it is likely that some of the students who choose to withdraw do so for academic reasons, this is rarely given as a reason; students usually cite other reasons for withdrawing and the reality is probably a combination of academic and other issues. For other students who have been coping well with the academic

demands, financial, health or family issues, or a combination of the three, are usually cited as a reason for withdrawal. Consequently there is unlikely to be any configuration of factors that will have even quasi-sufficiency for the outcome of withdrawing, however, there may be configurations with clearly higher levels of consistency with the outcome of withdrawing than others that may provide useful information.

The truth table shown below, Table 8.22, shows the results of an analysis using the factors of age, sex, programme of study, qualification and origin for the outcome of withdrawal. The highest consistency is for being a mature, male student on the social science programme with non-traditional qualifications from the local area. There are 38 cases in this row (row 1), while the next two rows (rows 2 and 3) only contain 8 cases. Row 4 contains 30 cases and the configuration includes mature male students on the science programme with non-traditional qualifications from the local area. This might appear to imply that mature, male students with non-traditional qualifications from the local area are at a greater risk of withdrawing than other students, however, together, these two pathways for withdrawal describe 68 cases with a consistency of around a quarter. This is such a small proportion of the whole dataset of 830 cases, it cannot be said that there is any real pattern to be found.

Table 8.22 Truth Table for the Outcome Withdrawing from the Programme

Row No.	OVER25	FEMALE	SOCSCI	TRAD QUAL	OTHER QUAL	LOCAL	number	WD	consistency
1	1	0	1	0	1	1	38		0.342105
2	1	0	1	0	0	0	6		0.333333
3	1	0	0	0	0	0	3		0.333333
4	1	1	1	0	1	0	8		0.25
5	1	0	0	0	1	1	30		0.2
6	0	0	1	0	1	1	30		0.2
7	0	0	1	1	0	1	16		0.1875
8	0	1	1	0	1	1	27		0.185185
9	0	0	0	1	0	1	11		0.181818

10	0	1	0	0	1	1	23		0.173913
11	0	0	0	0	1	1	19		0.157895
12	0	1	1	0	1	0	20		0.15
13	0	0	0	0	1	0	22		0.136364
14	1	1	1	0	1	1	61		0.131148
15	1	0	0	1	0	0	9		0.111111
16	1	1	0	1	0	1	16		0.0625
17	0	1	0	1	0	1	18		0.055556
18	0	0	1	0	0	0	57		0.052632
19	0	1	1	0	0	0	47		0.042553
20	1	1	0	0	1	1	71		0.042254
21	0	0	0	0	0	0	95		0.042105
22	0	0	1	0	1	0	24		0.041667
23	0	1	0	0	0	0	41		0.02439
24	0	1	1	1	0	0	17		0
25	0	1	1	1	0	1	15		0
26	1	0	0	0	1	0	8		0
27	1	0	0	1	0	1	8		0
28	0	1	0	0	1	0	10		0
29	0	1	0	1	0	0	7		0
30	0	0	0	1	0	0	16		0
31	1	1	1	1	0	1	7		0
32	0	0	1	1	0	0	17		0
33	1	0	1	1	0	1	4		0
34	1	1	0	0	1	0	4		0
35	1	0	1	0	1	0	7		0
36	1	0	0	0	0	1	3		0
37	1	1	0	1	0	0	3		0
38	0	1	0	0	0	1	2		0
39	1	0	1	1	0	0	2		0
40	1	1	1	0	0	0	2		0
41	0	0	0	0	0	1	1		0
42	0	0	1	0	0	1	1		0
43	0	1	1	0	0	1	1		0
44	1	1	0	0	0	0	1		0
45	1	1	1	0	0	1	1		0
46	1	1	1	1	0	0	1		0

8.2 Analysis of the 2010 cohort

For the 2010 cohort dataset, although the numbers are much smaller than for the seven cohort dataset, 156 cases versus 830, there are more input data and data on more types of success on the Foundation programme. As well as the audit-style data such as age, sex, qualification, origin and programme of study used in the seven cohort dataset, the data for this cohort also includes a measure of entry ability in maths, critical thinking, use of concepts of evidence and functional writing skills. The outcome variables of passing the programme and doing well on the programme have been supplemented with using concepts of evidence in a project and improving in a test of use of concepts of evidence.

8.2.1 Additional Data Collected specifically for 2010 cohort

General Ability Tests

As all the students began the programme with differing levels of prior education there was no consistent measure of students' intellectual ability which could be used. Instead, students were tested on three abilities, Maths, critical thinking and functional writing skills. Students' ability in Maths was calculated using a combination of both accuracy and completeness of the test and the scores were widely and evenly distributed. The scores varied from 20% to 100% with the mean score being 63.08%, SD of 18.95.

Students generally found the critical thinking test more challenging than the Maths test. The scores were widely and evenly distributed again, but in this case the mean score was 39%, with a range of 1.98% to 90%, SD of 16.60.

The test of functional writing skills subsequently grouped students based on the level of support needed with their spelling, punctuation and grammar. Group 1 had a high level of skill, Group 2 consisted of students who made a few mistakes and who would benefit from the general teaching of writing skills in the Key Skills, students in group 3 were given extra classes in writing skills and group 4 included home students with

dyslexia and overseas students with poor English language skills. The students in group 4 were given support on a more individual basis.

Test of Use of Concepts of Evidence

As an ability to use concepts of evidence was being used as a measure of preparedness for study at a research-intensive university, this test was conducted both before and after teaching. The initial test showed a fairly wide and even distribution, with a mean of 50.29%, with scores ranging from 5.7% to 91.4% and SD of 17.92.

A further statistical analysis was conducted on the input data for the use of concepts of evidence test to find out whether students choosing to study for progression to science-based degrees were more likely to begin the course with an understanding of evidence when compared with those students who chose to study social science. An independent samples T-test was run on the initial concepts of evidence score for the two programmes and there was a significant difference ($p=0.000$) between the two groups, with science students scoring on average 12 percentage points higher than social science students. As the input score for use of concepts of evidence showed a significant difference between students on the science and social science programmes, the same statistical analysis was conducted on the post-teaching concepts of evidence test. An independent samples T-test showed that there is still a significant difference ($p=0.004$), but less marked with the percentage point difference being 8 rather than 12. This difference, however, made using the raw score on the test problematic as an outcome, given the marked difference between starting point and end point for the two different groups of students. What was useful was to consider the improvement over the scores as this was likely to indicate which students benefitted from being on the programme and there was no significant difference ($p=0.114$) in the differences between pre- and post-teaching test for science students and social science students.

Use of Concepts of Evidence in a Project

The marks that students achieved for using evidence in a project show a skewed distribution towards the higher marks. The scores ranged from 0% to 88% with a mean score of 59.11% and SD of 19.69. The zero scores do not indicate non-submission, but rather where students scored no marks for use of evidence because they did not demonstrate any ability to use the concepts of evidence in a project.

Programme outcome

Of the 156 students who initially registered on the programme in 2010, 115 passed, 18 withdrew and 23 failed. The spread of marks, i.e. Foundation average, at the end of the year ranged from 9% to 90% with a mean of 62.82% and SD of 15.40. The very low scores were usually indicative of non-submission by students, rather than an exceptionally low performance.

Conscientiousness Index

The data on conscientiousness of students, which was calculated from students' attendance and timely submission of work, showed a skewed distribution with the majority of students scoring over 75% points. The CI scores ranged from 8% points to 96% points with SD of 15.30. As with the seven-cohort analysis, Table 8.23 below summarises the additional input and output data used in this analysis with an explanation of the abbreviations used.

Table 8.23 Showing the Abbreviations used for the input and output data

Inputs	Abbreviation	Description as explained below
Maths Test	MATHS73	Achieving 73% or more on the initial maths test
Critical Thinking Test	CRTI47	Achieving 47% or more on the initial critical thinking test
Functional Writing Skills	SPG1	Achieving a grade 1 for the initial functional writing test
Initial use of Evidence Test	PREEV60	Achieving 60% or more on the initial use of evidence Test

Final use of Evidence Test	POSTEV82	Achieving 82% or more on the final use of evidence test
OUTPUTS		
Improved in use of Evidence Test	IMPROVE	Students who improved their score between initial and end of year evidence test by more than one standard deviation
Applying use of evidence in a project	PROJEVIDENCE	Achieving a score of 65% or more for the concepts of evidence parts of the project

8.2.2 High Conscientiousness Index Score

From the results obtained with the seven cohort database, it can be seen that high conscientiousness stands out as an important factor in success and achievement for Foundation students; in the analyses of the seven cohort data, every outcome measured showed high conscientiousness being quasi-necessary. Consequently, conscientiousness was investigated in the 2010 cohort first, as this would need to be considered as an element in every configuration if the same were true. Several analyses of necessary conditions for a range of outcomes were then conducted for the Conscientiousness Index (CI) and the results, shown in table below, Table 8.24, indicate that CI is not strictly necessary, but is quasi-necessary at the level of at least 0.84 for all of the outcome variables considered and consequently CI was included in all the subsequent analyses.

Table 8.24 Analysis of conscientiousness as a Necessary Condition

Outcome	Consistency	Coverage
Passing the Programme	0.894737	0.927273
Doing well on the Programme	0.932432	0.627273
Improving	0.841463	0.711340
Good use of concepts of evidence in a project	0.869565	0.363636

8.2.3 Analysis of Passing the Foundation Programme

The first analysis was to consider which configurations of variables were sufficient for the outcome of passing the Foundation Programme and an initial analysis was conducted using the ability measures.

Four measures were used to assess “ability” of students as they started the programme. The cases were dichotomised into subsets of either high or low ability in each of the four areas. The decision about where to set the cut-off was based on the cohort i.e. norm-referencing was used with a measure of good performance based on a relative position in the overall cohort results. The threshold for the high ability set for maths was set at 73 and over, which was based on half a standard deviation above the mean of 63. The critical thinking ability score was set at 47 and over, again based on half standard deviation above the mean of 39. The use of concepts of evidence test score was set at 60 using the same method and functional writing skill was set at grade 1. The truth table below, Table 8.25, shows that several combinations of factors can lead to the outcome of passing the foundation programme. The threshold for consistency was set at 0.8 as there is a considerable jump in consistency between rows 20 and 21.

Table 8.25 Truth Table for the Outcome Passing the Foundation Programme

Row No.	MATHS73	CRIT47	SPG1	PREEV60	CI	number	PASSALL	consistency
1	1	1	0	1	0	2	1	1
2	0	1	1	0	1	2	1	1
3	1	1	1	1	1	12	1	1
4	1	1	1	1	0	2	1	1
5	1	1	0	0	1	8	1	1
6	0	1	1	1	1	1	1	1
7	1	0	0	1	1	7	1	1

8	0	1	0	0	1	1	1	1
9	0	1	1	0	0	1	1	1
10	1	1	0	1	1	5	1	1
11	0	0	1	0	1	4	1	1
12	0	1	0	1	1	1	1	1
13	1	1	1	0	1	4	1	1
14	0	0	0	1	0	1	1	1
15	1	0	1	1	1	3	1	1
16	0	0	1	1	1	2	1	1
17	0	0	0	1	1	2	1	1
18	1	0	0	0	1	18	1	0.944444
19	0	0	0	0	1	12	1	0.916667
20	1	0	1	0	1	8	1	0.875
21	1	1	0	0	0	7	0	0.714286
22	1	0	1	1	0	3	0	0.666667
23	1	1	1	0	0	3	0	0.666667
24	0	0	1	0	0	2	0	0.5
25	1	0	1	0	0	4	0	0.5
26	1	0	0	0	0	7	0	0.428571
27	0	0	0	0	0	5	0	0.2
28	1	0	0	1	0	1	0	0
29	0	0	1	1	0	0	0	
30	0	1	0	0	0	0	0	
31	0	1	0	1	0	0	0	
32	0	1	1	1	0	0	0	

The truth table solution, Table 8.26, was produced by setting the threshold at 0.8 and excluding rows with fewer than 5 cases and it shows that there are two pathways for students to pass the Foundation Programme, the factor showing the greatest coverage of cases for quasi-sufficiency is whether students have a high

conscientiousness index, a small number of cases indicate that demonstrating a high ability across three of the four tests without demonstrating a high conscientiousness index can also lead to the outcome of passing the programme.

Table 8.26 QCA output for the Outcome Passing the Foundation Programme

	Raw coverage	Unique coverage	Consistency
CI	0.889908	0.889908	0.941748
PREEV60*CRIT47*MATHS73	0.192661	0.018349	1.000000

solution coverage: 0.908257

solution consistency: 0.942857

Although two pathways were distinguished, the pathway that did not include a high Conscientiousness Index score had a very low unique coverage indicating that the majority of cases included a high CI score.

Having good functional writing skills did not form part of the pathway, but it may be that having lower functional writing skills is indicative of different issues between home and international students. Consequently a similar analysis was run with a subset of cases including only home students which showed that good functional writing skills (SPG1) were also important as part of a configuration of factors providing a pathway for home students to pass the programme, shown in Table 8.27.

Table 8.27 QCA output for the Outcome Passing the Foundation Programme for home Students

	Raw coverage	Unique coverage	Consistency
CI	0.750000	0.539474	0.966102
SPG1*CRIT47	0.315789	0.105263	0.960000

solution coverage: 0.855263

solution consistency: 0.955882

A solution coverage of 0.908 (Table 8.26) indicates that 90.8% of students who pass the Foundation Programme have either demonstrated an initial ability on tests at the beginning of the year and/or a conscientious attitude and a solution consistency of 0.943 indicates that 94.3% of students who demonstrated initial ability in tests and/or a conscientious attitude passed. This would indicate, unsurprisingly, that demonstrating some form of initial ability or having a conscientious attitude are quasi-sufficient for passing the Foundation Programme. The unique and raw coverage rates, however, indicate that many more cases have high conscientiousness either with or without test scores, than have lower conscientiousness levels with high test scores. Row three of the truth table (Table 8.25) shows that achieving highly on tests scores and having a high conscientiousness index are perfectly sufficient for the outcome of passing the Foundation Programme. In subsequent analyses, in order to reduce the complexity of the table, only one of the initial tests was used. The test of concepts of evidence was used because in rows 21-28 of the truth table, Table 8.25, where the condition had not been met, only four cases included achieving a high score on this test compared with 21 cases including a high Maths score, 10 cases with a high critical thinking test score and 12 cases with a high functional writing score.

The factor of prior qualification was then added to the analysis. The qualifications were coded as either TRADQUAL, meaning that the student had studied to at least to AS level; ISLQ, for international qualifications; or OTHERQUAL, which was composed mainly of vocational and GCSE level qualifications. In the truth table below, Table 8.28, not all the possible rows are shown; the rows where there are excluding combinations e.g. traditional qualifications and international qualifications have been removed.

Table 8.28 Truth Table for the Outcome Passing the Foundation Programme

Row No.	OTHERQUAL	ISLQ	TRADQUAL	PREEV60	CI	number	PASSALL	consistency
1	0	0	1	0	1	6	1	1
2	0	1	0	1	0	2	1	1
3	0	0	1	1	1	16	1	1
4	0	1	0	1	1	7	1	1
5	1	0	0	1	1	10	1	1
6	1	0	0	0	1	35	1	0.942857
7	0	1	0	0	1	16	1	0.9375
8	1	0	0	1	0	4	0	0.75
9	0	1	0	0	0	9	0	0.666667
10	0	0	1	0	0	3	0	0.666667
11	0	0	1	1	0	3	0	0.666667
12	1	0	0	0	0	17	0	0.411765

The threshold for consistency was again set at 0.8 and because the three types of qualification are mutually exclusive, the table can be simplified as shown below,

Table 8.29.

Table 8.29 QCA Output for the Outcome Passing the Foundation Programme

	Raw Coverage	Unique Coverage	Consistency
TRADQUAL*CI	0.201835	0.201835	1.000000
ISLQ*CI	0.201835	0.201835	0.956522
OTHERQUAL*CI	0.394495	0.394495	0.955556

solution coverage: 0.798165

solution consistency: 0.966667

This shows that the outcome of passing the Foundation Programme can be achieved through several combinations of factors; for those students who demonstrate high

conscientiousness it doesn't matter what type of qualification they come in with, or what score they achieved initially on the use of concepts of evidence test, as long as they demonstrate a high CI score, too.

8.2.4 Doing Well on the Foundation Programme

The next analysis was to see whether any combinations of the initial tests were indicative of doing well on the Programme, Table 8.30.

Table 8.30 Truth Table for the Outcome Doing Well on the Foundation Programme

Row No.	maths73	crit47	spg1	preev60	ci	number	fa65	consistency
1	0	1	1	1	1	1	1	1
2	0	1	0	1	1	1	1	1
3	1	1	0	1	0	1	1	1
4	1	1	1	1	0	1	1	1
5	1	1	1	0	1	4	1	1
6	1	0	1	1	1	4	1	1
7	1	1	1	1	1	13	1	0.923077
8	1	0	1	0	1	9	1	0.888889
9	0	0	0	1	1	3	0	0.666667
10	1	1	0	1	1	6	0	0.666667
11	0	1	1	0	1	3	0	0.666667
12	1	1	0	0	1	10	0	0.6
13	0	0	1	0	1	5	0	0.6
14	1	0	0	1	1	7	0	0.571429
15	1	0	0	0	1	21	0	0.52381
16	1	0	1	1	0	2	0	0.5
17	0	0	1	1	1	2	0	0.5
18	1	1	1	0	0	3	0	0.333333
19	0	0	0	0	1	13	0	0.230769
20	1	1	0	0	0	5	0	0.2

21	1	0	1	0	0	3	0	0
22	0	0	0	1	0	1	0	0
23	0	1	0	1	0	1	0	0
24	0	0	0	0	0	8	0	0
25	1	0	0	0	0	4	0	0
26	1	0	0	1	0	1	0	0
27	0	1	0	0	1	1	0	0
28	0	0	1	0	0	1	0	0
29	0	0	1	1	0	0	0	
30	0	1	0	0	0	0	0	
31	0	1	1	0	0	0	0	
32	0	1	1	1	0	0	0	

The threshold for consistency was again set at 0.8 and rows with fewer than 5 cases were excluded, giving the simplification shown below, Table 8.31. In this case there was only one pathway for the outcome of doing well on the Foundation Programme which is to demonstrate an initial ability in Maths and functional writing skills and to achieve a high CI score.

Table 8.31 QCA output for the Outcome Doing Well on the Foundation Programme

	Raw coverage	Unique coverage	Consistency
MATHS73*SPG1*CI	0.394366	0.394366	0.933333

solution coverage: 0.394366

solution consistency: 0.933333

The next analysis was to combine the tests identified in the previous analysis which contributed to pathways for doing well on the Foundation Programme, Maths and functional writing skills, with other factors previously identified as important in doing well on the Foundation Programme; mature, female students on a science

programme with high conscientiousness index scores. The truth table is shown below, Table 8.32.

Table 8.32 Truth Table for the Outcome Doing Well on the Foundation Programme

Row No.	OVER25	SCIENCE	FEMALE	MATHS73	SPG1	CI	Number	FA65	Consistency
1	1	1	0	0	0	1	1	1	1
2	1	0	1	1	1	1	1	1	1
3	0	1	1	1	1	0	1	1	1
4	0	1	0	1	1	0	1	1	1
5	0	1	0	0	0	1	1	1	1
6	0	0	1	0	1	1	1	1	1
7	0	0	0	0	1	1	1	1	1
8	1	1	0	1	0	1	2	1	1
9	1	1	0	1	1	1	6	1	1
10	0	0	1	1	1	1	2	1	1
11	1	0	0	1	1	1	3	1	1
12	1	1	1	0	1	1	4	1	1
13	0	0	0	1	1	1	4	1	1
14	0	1	1	1	1	1	2	1	1
15	0	1	0	1	1	1	7	1	0.857143
16	1	1	1	1	1	1	6	1	0.833333
17	1	1	1	1	0	1	4	0	0.75
18	0	1	0	1	0	1	12	0	0.666667
19	0	0	0	0	0	1	5	0	0.6
20	1	1	1	0	0	1	2	0	0.5
21	0	0	1	1	0	1	8	0	0.5
22	1	0	1	1	0	0	2	0	0.5
23	0	1	1	0	1	1	2	0	0.5
24	0	1	1	0	0	1	4	0	0.5
25	0	1	1	1	0	1	6	0	0.5
26	0	0	0	1	0	1	11	0	0.363636

27	1	0	0	1	0	1	3	0	0.333333
28	0	0	0	1	0	0	4	0	0.25
29	0	0	0	1	1	0	6	0	0.166667
30	1	1	0	1	0	0	2	0	0
31	1	1	0	0	1	1	3	0	0
32	1	0	1	0	0	0	6	0	0
33	0	0	1	0	0	1	1	0	0
34	1	0	0	0	0	0	3	0	0
35	0	0	1	1	1	0	1	0	0
36	0	0	1	0	0	0	2	0	0
37	0	1	0	1	0	0	1	0	0
38	0	0	0	0	0	0	7	0	0
39	0	1	1	0	0	0	1	0	0
40	0	1	1	1	0	0	1	0	0
41	1	0	0	0	0	1	2	0	0
42	1	0	0	0	1	0	1	0	0
43	1	0	0	1	0	0	1	0	0
44	1	0	1	0	1	1	1	0	0
45	0	0	1	1	0	0	3	0	0
46	1	0	1	0	0	1	5	0	0
47	1	1	0	0	0	0	1	0	0
48	1	1	0	1	1	0	1	0	0
49	1	1	1	1	1	0	1	0	0
50	0	0	0	0	1	0	0	0	
51	0	0	1	0	1	0	0	0	
52	0	1	0	0	0	0	0	0	
53	0	1	0	0	1	0	0	0	
54	0	1	0	0	1	1	0	0	
55	0	1	1	0	1	0	0	0	
56	1	0	0	0	1	1	0	0	
57	1	0	0	1	1	0	0	0	
58	1	0	1	0	1	0	0	0	

59	1	0	1	1	0	1	0	0	
60	1	0	1	1	1	0	0	0	
61	1	1	0	0	1	0	0	0	
62	1	1	1	0	0	0	0	0	
63	1	1	1	0	1	0	0	0	
64	1	1	1	1	0	0	0	0	

The threshold for consistency was again set at 0.8 and rows with fewer than 5 cases were excluded, giving the simplification shown below, Table 8.33.

Table 8.33 QCA output for the Outcome Doing Well on the Foundation Programme

	Raw Coverage	Unique Coverage	Consistency
female*MATHS73*SPG1*CI	0.256757	0.256757	0.950000
OVER25*SCIENCE*FEMALE*SPG1*CI	0.121622	0.121622	0.900000

solution coverage: 0.378378

solution consistency: 0.933333

There are two pathways described here. The first is that being male with good scores in maths and functional writing skills and a high conscientiousness score is quasi-sufficient for doing well on the Programme, the second is that being mature and female with good functional writing skills and a high conscientiousness index score is also quasi-sufficient. The low coverage however indicates that students with other combinations of factors can also do well.

8.2.5 Dataset of Improvers

One outcome which it was not possible to use for the seven cohort dataset was whether students improved during the course or not. There are likely to be some students who get more out of the course than others and who, in fact, need the

course more than others. As the outcome of interest was whether students are prepared for induction into the community of practice of a research-led university, the measure of improvement was based on the difference between the initial and end of year scores on the use of concepts of evidence test.

In order to identify characteristics of students who improve in this measure over the course of the programme, the factors of age, sex and conscientiousness index were explored using the improvers and low achievers dataset (IMPLA). The high achievers were removed from this database as they did not have the opportunity to demonstrate any improvement in this test. Once these cases had been removed, this left 98 cases to be analysed.

The truth table below, Table 8.34, shows that most cases in the configurations considered have the outcome of improving, so the threshold was set at 0.8.

Table 8.34 Truth Table for the Outcome Improving

Row No.	OVER25	FEMALE	CI	number	IMPROVE	consistency
1	0	0	1	21	1	0.952381
2	0	1	1	12	1	0.916667
3	1	1	1	17	1	0.882353
4	0	0	0	17	1	0.823529
5	1	0	1	15	1	0.8
6	1	0	0	4	0	0.75
7	0	1	0	7	0	0.714286
8	1	1	0	5	0	0.4

The solution to the truth table, Table 8.35, shows that there are two pathways, either having a high Conscientiousness Index, or being young and male, which are quasi-sufficient for achieving the outcome of improving.

Table 8.35 QCA Output for the Outcome Improving in the Use of Evidence Test

	raw	unique	
	coverage	coverage	consistency
CI	0.707317	0.463415	0.892308
over25*female	0.414634	0.170732	0.894737

solution coverage: 0.878049

solution consistency: 0.878049

The next analysis considered the origin of students, either from overseas, home but distant, or home and local, along with high conscientiousness and the truth table and solution below show, Tables 8.36 and 8.37, that local students with high conscientiousness are more likely to be improvers, whereas conscientiousness is not as important for distant home students or overseas students. What is interesting to note is that the solutions have high coverage and consistency indicating that the majority of students in this subset did improve over the year.

Table 8.36 Truth Table for the Outcome Improving in the Use of Evidence Test

Row No.	OVERSEAS	LOCAL	DISTANT	CI	number	IMPROVE	consistency
1	1	0	0	0	11	1	1
2	1	0	0	1	20	1	0.95
3	0	0	1	1	13	1	0.923077
4	0	1	0	1	32	1	0.84375
5	0	0	1	0	10	1	0.8
6	0	1	0	0	12	0	0.416667

Table 8.37 QCA Output for Outcome Improving in the Use of Evidence Test

	raw coverage	unique coverage	consistency
OVERSEAS	0.365854	0.365854	0.967742
DISTANT	0.243902	0.243902	0.869565
LOCAL *CI	0.329268	0.329268	0.84375

solution coverage: 0.939024

solution consistency: 0.895349

8.2.6 Analysis of Project Evidence Use for 2010 Dataset

As outlined in chapter 6, there is evidence that students apply knowledge differently in different contexts and it may be that students can use concepts of evidence in a test, but do not then apply that in a real situation of conducting a research project. Consequently, the next analysis considers the factors that affect the outcome of a high score in the use of evidence in the project. In the truth table below, Table 8.38, it can be seen that there was low consistency with the outcome of a high score in use of evidence in the project, such that only one configuration achieved 0.7.

Table 8.38 Truth Table for the Outcome Use of Evidence in the Project

Row No.	OVERSEAS	OVER21	POSTEV82	CI	number	PROJEVIDENCE	consistency
1	0	1	1	1	20	1	0.7
2	0	0	0	1	4	0	0.5
3	1	1	0	1	7	0	0.428571
4	0	1	0	1	28	0	0.428571
5	0	1	1	0	7	0	0.428571
6	1	0	1	1	10	0	0.3
7	0	1	0	0	16	0	0.25
8	0	0	1	1	5	0	0.2
9	1	0	0	0	9	0	0.111111
10	1	1	0	0	4	0	0

As would be expected, one of these factors was achieving a high score on the use of evidence test taken at the end of the programme, along with being a mature, home student with high conscientiousness, Table 8.39.

Table 8.39 QCA Output for the Outcome Use of Evidence in the Project

	Raw coverage	Unique coverage	consistency
overseas*OVER21*POSTEV82*CI	0.304348	0.304348	0.700000

solution coverage: 0.304348

solution consistency: 0.700000

In order to analyse the relevant importance of these factors several analyses of necessity were carried out into the outcome variable of a high score in the use of evidence in the project, looking specifically at achieving a high score in the post evidence test, being a home student and having high conscientiousness, Table 8.40. Being a home student, i.e. not overseas, showed the greatest consistency with necessity at 0.8 and being mature at 0.78 and having a high conscientiousness score at 0.76 could also be considered quasi-necessary, but with a consistency of 0.51 it is clear that a high score in the evidence test is not necessary for a high score in the use of evidence in the project.

Table 8.40 Analysis of Necessary Conditions for the Outcome variable: use of evidence in a project

Conditions tested	Consistency	Coverage
CI	0.760870	0.416667
OVER21	0.782609	0.375000
overseas	0.804348	0.377551
POSTEV82	0.514286	0.473684

8.3 Discussion of the Findings

8.3.1 Sufficient Conditions

Passing the Programme

For the analysis on the factors required for passing the Foundation programme, two pathways were identified for the seven-cohort students as being quasi-sufficient; being a female, mature student or having a high conscientiousness index. For the 2010 cohort it was possible to explore in more depth some other aspects of the students in the study as some ability measures were taken at the beginning of the year. This allowed further aspects of ability and prior qualification to be explored. In the analysis to determine sufficient conditions for the outcome of passing the Foundation Programme for this cohort of students, it was found that it was sufficient (consistency 1) to demonstrate high CI and ability. Each of these attributes also demonstrated quasi-sufficiency alone, however, the ability pathway showed a low unique coverage (0.018) compared with a high CI score (0.890) indicating that it was much more common for students to demonstrate a high CI score, with or without ability tests and pass the programme than to pass while demonstrating ability without a high CI score.

A third factor, previous academic achievement, was also considered and several pathways identified. Students with traditional qualifications needed to either demonstrate high CI or high ability to pass the programme. Students with non-traditional or international qualifications, however, needed to demonstrate a high CI for quasi-sufficiency. In the example of the prior qualification, there was little difference in terms of the outcome of passing the programme, the pathway for traditional qualifications and ability, without a high CI score was based on only two cases, both male in their early twenties. This is one of the advantages of QCA, that it is possible to go back to the case level and identify other aspects of particular pathways.

Doing Well on the Programme

There were three pathways identified for doing well on the Foundation Programme from the seven-cohort study, all of which included high conscientiousness. Two pathways were for young students studying science with one for international students and the other for local students who had studied to at least AS level. Both of these groups of students would have studied recently and this may have given them an advantage in achieving higher marks in the more content-based science routes. The third pathway described mature, home students studying on the social science programme where their greater life experiences may make a difference in how they interpret and approach the learning (Hanson, 1996; Knowles, 1996; Mezirow, 1981).

There was a similar pattern when the outcome of doing well on the programme was analysed in the 2010 cohort. Students with non-traditional qualifications needed to demonstrate both ability and high CI, whereas for those with traditional or international qualifications it was sufficient to demonstrate high CI. These results are consistent with the concepts that non-traditional students need to be selected in different ways from those who have taken a more traditional route to university. The analysis conducted on the home students showed that a certain level of functional writing skills was an important factor in doing well on the Foundation Programme for non-traditional students and this finding needs to be explored further.

Achieving an Honours Degree

Considering the outcome of achieving an honours degree, there were four pathways identified and again high conscientiousness was present in all of the pathways. For one pathway, being a local, mature, female student with non-traditional qualifications who did well on the Foundation Programme was quasi-sufficient to achieve an honours degree. Being a local, female student taking a science route required previous study to at least AS level, and having done well on the programme to show

quasi-sufficiency for the outcome. Again this may indicate that previous study is of greater benefit for students taking science degrees, where there is a greater reliance on specific knowledge. There were two pathways for young, international students which showed quasi-sufficiency with achieving an honours degree; one route required that students had done well on the programme and it included being male and taking a science route; in the other pathway students had not done well on the programme and were taking a social science route. This finding may be related to students' facility with the English language. International students studying science modules will be less disadvantaged in demonstrating their potential as the requirement for writing in English is reduced when compared to the essays required in the social science modules. As the students progress through their degrees, their use of English is likely to improve giving a more accurate picture of their ability at the end of their degree than during their Foundation Programme. Although doing well on the Foundation Programme was a factor in three of the pathways, it did not demonstrate necessity when tested. It may be that similar to the international students there are also home students who are on an upward trajectory in terms of their achievement.

Achieving a Good Honours Degree

While there were several pathways which were quasi-sufficient for achieving an honours degree, there was only one pathway identified for the outcome of achieving a good honours degree, in this case defined as achieving a 1st or 2:1 class degree. The only quasi-sufficient pathway for the outcome of a good honours degree was being female, having studied to at least AS level, having done well on the Foundation Programme and having a high CI, and of these both a high CI (consistency 0.93) and doing well on the Foundation Programme (consistency 0.84) were found to be quasi-necessary. It is of interest that having traditional qualifications was not necessary

(consistency 0.28) for achieving a good honours degree, meaning that not having studied to at least AS level is not a barrier to achieving a good honours degree.

Improvement

For some students it may be argued that they could progress to a degree without studying on the Foundation Programme and that they need the qualification to demonstrate abilities that they already possess. For others, however, it is likely that they need the teaching of skills and knowledge in order to make a success of degree level study and it would be expected that such students would demonstrate improvement over the year. There were three pathways elucidated for quasi-sufficiency in the outcome of improving; being an overseas student, being a home student not from the local area and the third pathway was being a local student with a high CI score. The distinction between local home students and distant home students was made because of the issues of geographical limitations for some students. Students who are able to move away from their home area to study are likely to have both practical and dispositional differences from students who stay. It is interesting that the improvement pathway for local students requires the input of a high CI score as this may be related to development of a learner identity and immersion in the Higher Education culture, discussed in Chapter 9.

Use of Evidence in a Project

Good use of evidence in a project was shown to be linked to success on the Foundation Programme, which in turn correlated with achieving a good honours degree. It is proposed that being able to use concepts of evidence in a project indicates the type of thinking approach that will support degree level study in a research-led university. A high CI score was required in the pathway for the outcome of good use of evidence in a project as was being a home, mature student who demonstrated a good score on the use of evidence test at the end of the programme. In fact being a home student (consistency 0.80), being a mature student (consistency

0.78) and having a high CI score (consistency 0.76) were shown to be quasi-necessary for being good at using evidence in a project. The finding could also be expressed in terms of it being quasi-necessary to NOT be an international student in order to be able to use evidence in a project. There was no apparent difference between home and international students in performance on the test of understanding of concepts of evidence, indicating that international students were able to use the knowledge of concepts of evidence in a test situation better than they were able to apply the knowledge. This finding warrants further exploration with regard to the apparent difficulty that international students find in applying concepts of evidence in a practical situation.

Withdrawal from the Programme

It was not anticipated that there would be any clear identifying factors for students who withdraw from the programme and this was found to be the case. The wide-ranging reasons for withdrawal and the relatively small numbers make any meaningful analysis difficult. This is an area where auto/biographical narrative data (Merrill & Tett, 2013) is likely to be of more use in elucidating the reasons for student withdrawal.

8.3.2 Necessary Conditions

Conscientiousness

A high Conscientiousness Index score was found to be quasi-necessary for passing the Foundation Programme and for doing well on the Foundation Programme in both the seven-cohort study and the 2010 study; for achieving an honours degree and for achieving a good honours degree i.e. a 1st class or 2.1 in the seven cohort study; and improving in use of evidence test score and demonstrating good use of concepts of evidence in a project in the 2010 cohort study. No other factor explored in these two studies showed the same levels of necessity for any of the outcomes.

On analysing what factors affected the outcome of having a high conscientiousness index in the seven cohort study, two pathways were found to be quasi sufficient; mature females who were not local and mature local students on the science route. Although maturity was a factor in both pathways, it was not found to be necessary.

The results from the analysis to explore the role of both sex and age on development of high CI in the seven cohort study, while not conclusive and cross-sectional rather than longitudinal, show a particular trend in terms of age and conscientiousness, as young men aged between 21 and 24 showed the most likelihood of demonstrating a low CI (consistency 0.68); males under the age of 21 showed a lower likelihood of demonstrating a low CI than their older counterparts in their early 20's (consistency 0.57)

For women in the seven cohort study, the younger women, aged under 21, were more likely to show a low CI score (consistency 0.42) than those aged between 21 and 24 (consistency 0.32), however, the likelihood of demonstrating low CI was higher for females over the age of 24 (consistency 0.49). It might be argued that rather than measuring the personality trait conscientiousness, older females may be taking on a greater burden of family responsibilities and the behaviours measured, particularly attendance, might reflect this rather than a personality trait. If women demonstrate higher conscientiousness traits than men, then this may explain the finding that being female is part of the quasi-sufficient pathway for the outcome of a good honours degree.

Doing Well on the Programme

A further study of necessity showed that doing well on the Foundation Programme, i.e. achieving an average mark of 65% or over was quasi necessary for achieving a good honours degree i.e. 1st or 2:1, but was not necessary for achieving an honours

degree. This is a helpful measure of the predictive nature of the Foundation Programme and will feed into further studies into benchmarking and standards.

8.3.3 Assumptions

As outlined in Chapter 5, it was important to establish what measures would distinguish successful performance at Foundation level and a set of assumptions were made:

1. That ability to use concepts of evidence would demonstrate thinking skills which would support induction into the community of practice of a research-intensive university
2. That this use of concepts of evidence will be important across the disciplines and not just for science-based programmes.
3. That if being able to demonstrate an application of concepts of evidence is an indication of successful preparation for induction into the community of practice of a research-led university, there should be a correlation between performance on a project, performance at Foundation level and degree outcome.

One test of these assumptions was to ask whether non-traditional students who chose to study science subjects already had a better understanding of concepts of evidence when compared with non-traditional students who chose to study social science. This was found to be the case as the students who chose to study a science route performed better by 12 percentage points on the initial test of use of evidence than students who chose to study social science routes. This would tend to indicate that students generally make choices to enable them to 'play to their strengths' and they are making informed choices about their capabilities. Further analysis of correlation between choice of route, use of concepts of evidence in a

project and final foundation average scores indicated that students on both the science programme and the social science programme improved their understanding of concepts of evidence in a test and both demonstrated that being able to apply concepts of evidence in a project was correlated to doing well on the Foundation Programme. Consequently the evidence is pointing towards the ability to use of concepts of evidence being a useful skill across the disciplines.

The results from the 2010 cohort study have shown a link between good use of concepts of evidence in a project and achieving an average mark of 65% or higher on the Foundation Programme. The seven-cohort study demonstrated a correlation between an average mark of 65% or higher for the Foundation Programme is correlated, and indeed necessary, for achieving a 1st or 2:1 class degree. These correlations indicate that the final assumption was a reasonable one to make.

CHAPTER 9: Discussion and Implications

Introduction

This thesis explored the factors affecting non-traditional students' academic success in a research-led university. The literature review drew heavily on Bourdieu's concepts of capital, habitus and field to argue that the underrepresentation of certain groups in Higher Education could be due to one or more of three general reasons; lack of suitable prior education, bias in recruitment practices on behalf of institutions, or learner identity leading to alienation from the predominant culture in Higher Education for some groups. There was evidence that all three of these factors may play some part in the process leading to underrepresentation of individuals from lower socio-economic groups, ethnic minorities and mature students. The fourth group of underrepresentation, based on sex, showed a more complex pattern, with men showing an overall underrepresentation compared with women, but with women being less well represented in elite universities. Given that the study was based on a programme at a research-intensive university specifically designed to widening participation, the study did not attempt to explore recruitment practices, but instead attempted to elucidate the role of prior education and factors implicated in learner identity in students' academic outcomes. As described earlier, students from disadvantaged backgrounds are more likely to attend university later in life, leading to conflation of different factors for underrepresentation in the same students. In order not to lose these nuances the use of Qualitative Comparative Analysis, with its case-led approach, allowed for a range of different combinations of factors leading to the same outcome to be identified.

The implications of the results of the study will impact on how the Foundation Programme is run. The wide range of pathways leading to student success indicate that a diverse student group does not detract from the quality of academic output. The range of pathways also indicate that there is no clear set of selection criteria for

non-traditional students with the exception of the Conscientiousness Index (CI) which was found to be quasi necessary in all of the measures of success considered in this study. There is evidence that student behaviours associated with the CI are either an important aspect of an effective learner identity or that they support the development of an effective learner identity. Consequently the results indicate that further work to explore the CI in more depth will be helpful to elicit whether it is possible to employ teaching and learning methods to improve students' CI scores. The correlation between use of concepts of evidence and success for Foundation students also requires further exploration and one outcome of the study may be to explicitly teach these ideas about evidence on the Programme.

9.1 Challenges and Advantages for Underrepresented Groups

9.1.1 The Effect of Previous Education

For this study there were two ways in which initial education was considered; the first was to note the level of qualification achieved by the student and the second was to measure how well students did in the performance of some initial tests. In the analyses outlined in Chapter 8, the previous qualifications of students were important inputs for the pathways for doing well on the programme i.e. achieving a Foundation Average of 65% or more, but did not form part of the quasi-sufficient pathways for passing the programme. There were three pathways for doing well and all of them included students who had studied to at least AS level or who had International School Leavers Qualifications. Two of the pathways for doing well also included studying the science pathway and being aged under 21 years of age. This would indicate that, particularly for studying science-based modules recent study may give an advantage to a student. This apparent advantage was not seen in the pathways for achieving an honours degree, where there were three pathways, each with a different type of previous qualification which showed quasi-sufficiency for the outcome of achieving an honours degree. It was only when the outcome of achieving

a good honours degree i.e. a 1st or 2:1 class degree was analysed that previous qualification was again part of the pathway. Having studied to at least AS level, as opposed to having non-traditional or international qualifications, was part of the only route showing quasi-sufficiency for the outcome of a good honours degree. The pathway had a coverage value of 0.22, and previous qualification was not a necessary input for achieving a good honours degree, indicating that other aspects of the pathway, having a high Conscientiousness Index score and having achieved well on the Foundation Programme, were more important aspects of this pathway.

The initial tests given to the 2010 cohort as a mechanism for assessing basic skills in numeracy, functional writing skills, critical thinking and use of evidence were used as an alternative method of determining previous education i.e. what skills and knowledge they possessed regardless of what previous qualification they had achieved. Traditional statistical methods showed no significant difference between students of different previous qualifications in their test scores, with the exception of International students who were less likely to do well on the test of functional writing skills. Demonstrating an initial good ability in the tests were elements of quasi-sufficient pathways for passing the programme and for doing well on the programme, particularly for Maths and functional writing skills.

There are likely to be students who need the preparation offered by the Foundation Programme more than others i.e. some students may already have skills and knowledge to allow them to successfully access a degree, but do not have an official qualification to prove it. The pathways that led to the outcome of improvement over the year did not show a particular previous qualification as being important, but that other inputs were more important to indicate whether a student improved or not. There was no consistent relationship between success and prior education indicating that this is unlikely to be a reliable basis for selection of students.

9.1.2 Alienation

The students in this study had made the choice to attend an elite, research-intensive university and as such may not be a representative sample of non-traditional students experiencing alienation from the dominant culture. They do, however, represent a range of non-traditional students, allowing an exploration of whether there are particular groups who struggle to adjust more than others. According to Cushner (1994a), the issue of belonging is an important concept. When excluded, individuals experience feelings of loneliness, alienation and loss of self-esteem, and a decreased sense of direction and purpose become apparent. The lack of social mobility in Higher Education may become self-perpetuating, where underrepresentation by groups of people at a particular institution can lead to beliefs of alienation and lack of acceptance. When 65% of independent school A level students secure a place at the most selective institutions, compared with 26% from state schools (Cable, 2011), there may be a perceived message that Higher Education is only for those with resources. State school students may also be responding to feelings of alienation developed during their initial education. For example, participants in a study of ethnic minority students in Higher Education described how their negative experiences of school meant that they faced entering higher education with trepidation that past humiliations and failures would be repeated (Bowl, 2003). Consequently the study considered aspects of age, sex and origin of the students in measures of their success.

In the analyses of passing the Foundation Programme there were two pathways shown in the seven-cohort study as being quasi sufficient; having a high CI score or being a mature female student. Mature female students are more likely to have family responsibilities preventing them from attending class or completing their assessments on time (both of which are indicators captured by the CI) and it may be that such students are managing their learning on their own timescales e.g. by using

the virtual learning environment to catch up on work missed, in a way that enables them to gain enough from the programme to pass. For doing well on the programme, it was mature students who had come from another part of the country, studying social science, who formed one of the pathways. This would indicate that there is a difference between local students who are balancing home life with student life and distant students who can immerse themselves in the student culture.

Being a mature student was a quasi necessary condition for doing well in using evidence in a project, as was being a home student. The international students seemed to have more problems with applying what they had learned about concepts of evidence to a 'real' situation, despite achieving good marks in a test of concepts of evidence. It may be that mature students are more able to apply knowledge because they have had that experience already in non-academic situations. Mature students who have non-traditional qualifications who do well on the Foundation Programme and have a high CI score form a quasi sufficient pathway for achieving an honours degree. By tracking the students from the 2010 cohort it will be possible to explore which students go on to do well in terms of degree outcome and whether the difference in application of concepts of evidence is a predictor of achievement at degree level.

9.1.3 Conscientiousness Index

The use of QCA has highlighted that there is a range of different routes to success on the Foundation Programme and the subsequent degrees, but only the input of a high Conscientiousness Index was consistently important in all aspects of student success. Conscientiousness, as outlined in Chapter 4, is one of the 'Big Five' personality traits outlined in the Five Factor Model (FFM) by Digman (1990) as a grand unifying theory of personality and has been studied in relation to its effect on learning and academic performance. A range of studies have shown that personality plays an important role in academic achievement, for example a study of

acculturation of Chinese students in Germany found a positive correlation between conscientiousness and academic and psychological adjustment in the students (Zhang, Mandl, & Wang, 2010). Poropat (2009) outlined a feasible connection between intelligence, socioeconomic status and personality in affecting academic performance, by relating them to capacity to perform – intelligence, opportunity to perform – socioeconomic status, and willingness to perform – personality. Having established that other meta-analyses had correlated intelligence and socio-economic status to academic performance he then conducted a meta-analysis of the research into the role of the Five Factor Model in academic performance. His results showed not only that academic performance was associated with conscientiousness, but that the overall association between conscientiousness and academic performance was of a similar magnitude to that of intelligence. Controlling for intelligence did not alter the correlation between conscientiousness and academic performance. The effect of conscientiousness became greater through secondary and tertiary levels of education. In a study of personality and learning processes, Klimstra *et al.* (2012) found that conscientiousness was associated with the educational dimension of exploration in depth which mirrored other studies (De Feyter, Caers, Vigna, & Berings, 2012) showing that students with high conscientiousness developed focused learning strategies, deeper processing approaches and were more disciplined and achievement orientated.

The cross-sectional study of conscientiousness with age described earlier in Chapter 4 (Soto *et al.*, 2011) showed a high degree of stability of conscientiousness in adulthood and an increase in conscientiousness with age, however, this was not a simple correlation, but a more complex, curvilinear pattern. Instead of a linear trend towards greater psychosocial adjustment, the research indicated that there is a negative age trend in conscientiousness between childhood and early adolescence, which reversed into a positive trend into early adulthood, with this trend continuing

more gradually through into older adulthood. From this they conclude that “the biosocial changes and challenges of early adolescence...are often accompanied by negative personality trends” (Soto *et al.*, 2011, p. 341).

This maturation effect with conscientiousness was not observed in a study by Kelly *et al.* (2012) who found that in a population of medical students there was no difference in the conscientiousness levels of students aged under or over 21 years old. A further study of medical students (Chaytor *et al.*, 2012) showed no change in CI from one year to the next. The study of Soto *et al.* was conducted using the World Wide Web and collected data from over 1 million individuals whereas the studies by Kelly *et al.* and Chaytor *et al.* was a specific demographic of medical students who were likely to have elements of shared personality traits in order to have chosen, and been selected, to study medicine. Both studies were cross-sectional in nature and more robust results would require a longitudinal study.

The findings of this thesis showed that on the Durham University Foundation Programme, young men in their early 20's had the lowest CI scores and this does not mirror the work by Soto *et al.* (2011). It may be that two different populations are being observed; young men with higher levels of conscientiousness may be likely to have shorter breaks in their education, returning to study as soon as possible, whereas those requiring a longer period of time to mature and develop conscientiousness return to education later. A study of Five Factor Model by Klimstra *et al.* (2012) investigated academic progression to the subsequent year of study in university students and they found that males were more likely to face study delays and that low conscientiousness was associated with study delays. In fact conscientiousness was found to be the only significant predictor of academic progress in their study. It may also be related to the resources effect (Schmitt *et al.*,

2008) and that young men from lower socioeconomic backgrounds are less likely to develop conscientiousness due to lack of resources.

9.1.4 Student identity

It may simply be that having a high CI score means that a student is more likely to be immersed and accepting of the culture of Higher Education and consequently developing a learner identity which supports their success and learning. As outlined in Chapter 5, communities of practice can support students to develop an identity to engage and identify with that community and as such are less likely to feel aspects of alienation leading to withdrawal from the course. The findings of the study do show a difference between home students from a distance and local home students which seem to indicate that local students who are experiencing two different cultures at the same time, home and HE, may find it more difficult to succeed than the distant students, who may be living in student accommodation and who are consequently experiencing a greater immersion in the HE culture.

West, Fleming and Finnegan (2013) note that the sociological focus of Bourdieu's explanation for lack of cultural capital preventing non-traditional students from succeeding in education fails to account for those non-traditional students who do succeed and that perhaps there are other explanations to be found when considering psychological aspects of learner identity. They propose that older learners develop resilience having survived life crises which allows them to persevere despite difficulties encountered due to lacking cultural capital. It may be that the CI score encapsulates a facet of this resilience also.

What the data do show is that lack of study through the traditional routes should not be a barrier to Higher Education. It may be that the life skills learned by mature students make up for the lack of cultural capital which made HE less accessible to them at 18. What it does indicate is that for social mobility to be a reality in HE there

needs to be more acceptance of alternative routes rather than the standard A level route at 18.

9.2 Limitations of the study

9.2.1 Qualitative Comparative Analysis

There are some limitations with the findings presented in this study. QCA is a relatively new analytical method and some researchers have reservations about it. Goldthorpe (1997), for example, made the observation that the process of dichotomising interval data as is required for csQCA has two drawbacks, one is that the nuanced gradations from one level to another is lost and the decision about where to place the cut-off for the inclusion or exclusion into a set may be arbitrary or open to manipulation. The argument against this made by Rihoux and Ragin (2009) is that the simplification into dichotomous sets allows for a different level of complexity to be investigated: the sacrifice of complexity within one variable allows the complexity of combined variables to be examined. With regard to the setting of the cut off, it is important that the threshold is selected carefully as, according to Goldthorpe (1997), it will greatly affect the subsequent analysis. The data used in this study did include sets of interval data which needed a cut off to divide the students into sets. For example, the students were divided into two sets based on having done well on the Foundation programme or not based on whether they scored above or below 65% overall on the programme. The rationale for choosing 65% as the threshold value for selecting cases to be within the groups 'done well on the Foundation Programme', was based on analysis of previous cohorts of students who had progressed to degrees and qualified. The scores on the Foundation Programme were compared with degree outcome using an Anova analysis which showed a significant correlation ($p=0.000$) over a period of 10 years and a score of 65% on the Foundation Programme was a strong indicator that the student would go on to

achieve a upper second class degree or higher. In addition to having a clear rationale for this dichotomisation, as outlined in Chapter 7, many of the other inputs were categorical by nature.

QCA and small-N

Because QCA was developed initially for analysing data from the area of political science this necessitated considering a small number of cases with a 'macro' level of comparison i.e. at the level of states or societies. The advantage of QCA is that it can deliver more meaningful results with smaller numbers of cases than some other methods, and "it allows integration of both qualitative and quantitative forms of evidence, and is transparent and systematic" (Dixon-Woods *et al.*, 2005, p. 50). It also does not need variables to be measured at the interval level, as many statistical methods do (Grofman & Schneider, 2009).

Equal weighting

A further concern about QCA is that each of the combinations of configurations leading to a particular outcome are given equal weighting, but Rihoux and Ragin (2009) consider this to a strength of the method as it allows consideration of outliers which would normally be discarded in traditional statistical methods, but may provide more interesting and complex information in a social science situation.

9.2.2 Five Factor Model

There are also criticisms of the Five Factor Model (FFM). Block (1995, 2010) for example, argues that the FFM has limited scope and does not explain all of human personality; that the model is not based in a clear theory, but arose out of observations linked by factor analysis; that the language of the model is directed at lay-people rather than experts; and that the measurement of the traits by self-reporting is open to misrepresentation, particularly in areas where individuals may feel that they "are not willing or are not able to validly present themselves" (1995, p. 209).

An additional consideration with regard to conscientiousness is that this study considered a measure called the Conscientiousness Index (CI) which has been presented as a proxy for the actual trait of conscientiousness. The CI measure was based on work by McLachlan *et al.* (Chaytor *et al.*, 2012; Kelly *et al.*, 2012; McLachlan *et al.*, 2009) who developed a similar measure in studies with medical students where they found that using a CI based on attendance and submission of required information correlated strongly with staff and student perceptions of professionalism and performance in both skills and knowledge exams (Kelly *et al.*, 2012). Measures of conscientiousness as predicted by written Personal Qualities Assessments (Revised NEO Personality Inventory, NEO-PI-R) administered before entering a study programme correlated strongly with measured CI as constructed by McLachlan *et al.* in performance once the programme was under way (unpublished data) indicating that this object measure of behaviours is measuring at least an aspect of or a proxy for the personality trait conscientiousness. Although the CI was correlated to the NEO-PI-R in the studies of medical students, this was not replicated in this study.

It could be simply that attending the classes ensures that the students benefit more from the teaching offered whereas handing work in late may mean that the work is marked differently from the bulk of the assessments. It is possible for students to access any work from classes that they miss by using the virtual learning environment, DUO, which is kept up-to-date with all material from lectures. In addition to this there are regular weekly workshops available to students either to access help with difficult topics or to catch up with missed work. Foundation Centre staff also make themselves available to students who have missed work on an informal basis. This should reduce the level of disadvantage to students who miss classes; they can still access the information in other ways, if they wish.

In the seven-cohort study there was one pathway for passing the Foundation Programme which did not include having a high CI score; this pathway which included the variables of being mature and female. It may be that using attendance as part of the measure for conscientiousness gives a less accurate result as anecdotally such students are more likely to have domestic responsibilities necessitating greater levels of absence. If this is the case, then it would indicate that for some female students having a low CI as measured here is maybe not a true measure of a personality trait and they catch up with the work missed.

9.3 Implications and Further Work

9.3.1 Generalisation

There are three main claims arising from this work. The first is that performance on the Foundation Programme is a good predictor of subsequent success in a degree. The second is that attitudinal factors as indicated by the Conscientiousness Index play an important part in student success and may be of predictive value in identifying students likely to succeed. The third is that understanding of concepts of evidence is also linked to student success and may have a similar predictive value.

The study was conducted with non-traditional students at an English University, and so there may be little which can be applied to the general or international student population. There are researchers who argue when conducting interpretative, qualitative research it is not possible to make generalisations (Denzin, 1983; Taylor, 1994). Williams (2000), however, argues that most interpretive research has an element of generalisation about it, even though it may not be acknowledged as such, and that there is usually some aspect of “inferring from specific instances to the characteristic of the wider social milieu” (p. 212). He goes on to suggest that there are three levels of generalisation: total generalisation which arises from

demonstrations of a general deterministic law; statistical generalisation where traditional statistical methods are used to calculate the probability that the observations of a sample can be attributed to a population; and ‘moderatum’ generalisation which he describes as “the modest, pragmatic generalisations drawn from personal experience which, by bringing a semblance of order and consistency to social interaction, make everyday life possible” (Payne & Williams, 2005, p. 296). This is very similar to the idea proposed by Bassey (2001) that it is sometimes acceptable to claim ‘reliability’ or ‘fuzzy generalisation’ when there is appropriate fit between the situation studied and others which may be of interest.

The nature of QCA being a bridge between qualitative and quantitative methods means that it is possible to make at least moderatum generalisations from this study to the wider student environment and it can be argued that the links between student success and CI and understanding of concepts of evidence are strong enough to be of interest to groups of educators beyond those in the field of Foundation programmes. The implications of the claims made here about the potential role of CI and concepts of evidence in predictions of success will be considered further.

9.3.1 Selection

The QCA analysis of some of the factors affecting success; initial education, ability, and aspects of learner identity such as sex, age and origin provided some insight into the types of students who might benefit most from a Foundation Programme. The research did show differences between students based on initial education, but students who did not have traditional qualifications were still able to do well if they demonstrated ability on initial tests and had a high conscientiousness index. There were sex differences noted, but these may be related to the higher conscientiousness levels of women. Some differences were noted for students who were local to the area implying that more could be done to support the needs of students who are managing their studies around domestic responsibilities. However,

the strongest result from the study was the correlation between a high CI score and student outcome.

As discussed earlier in this chapter, the CI score has been shown to be quasi necessary for all measures of success for Foundation students and further work could be done to explore this measure in more depth. The work done by McLachlan's team to correlate CI to NEO-PI-R scores could be replicated to find whether there is the same level of association between the objective score and self-reported behaviours on the questionnaire. There would also be value in collecting more biographical information from students, from a very simple level of whether they have family responsibilities e.g. children, elder-care, partners, paid employment, to more complex narrative data collected through interviews, reflective logs by students and autobiographical writing by students.

It could be argued that although these are a particular set of Higher Education students, the CI score appeared to have a strong predictive effect for outcomes deemed important in a research-intensive university, and that it would certainly be worth exploring its predictive qualities in the general and international student populations. Certainly standard measures of predictive degree outcome e.g. GCSE grades, AS level grades and predicted A level grades in the UK have limited value; GCSE and AS level grades having an accuracy of around 70% for predicting a subsequent good degree performance (Laws, 2013) and they tend to favour students from independent school backgrounds (Mellanby, Cortina-Borja, & Stein, 2009). Other studies do show a strong correlation between prior academic achievement and outcome for traditional student populations, but it is certainly not the only factor, with dispositional attributes also having a predictive quality (Cassidy, 2012; Porchea, Allen, Robbins, & Phelps, 2010). Given the recognition that Bourdieu's concepts of capital are applicable to the UK education system (Archer & Hutchings, 2000;

Crozier, Reay, Clayton, Colliander, & Grinstead, 2008) it is unlikely that prior academic achievement alone will be an appropriate measure of students' potential to do well at university.

The findings therefore indicate that using previous study to at least AS level for mature, non-traditional students is not the best indicator of potential, but that attitudinal attributes, specifically those correlated with conscientiousness are much better indicators of success. It may be tempting to use a measure of conscientiousness as a selection tool by asking applicants to take a personality test such as the NEO personality inventory as part of the application process. As Poropat (2009) points out "apart from previous academic performance, intelligence is probably the most used selection tool for entrance to tertiary education" (2009, p. 331) and argues that his finding of conscientiousness having similar levels of validity to those of intelligence would make it a useful tool for selection if a valid measure could be found. The CI being based on objective measures, rather than self-reporting, overcomes the issues of individuals falsifying their responses.

The introduction of different methods of university selection particularly to widen participation has been suggested already. Sternberg (2008) reported a study based on his own Sternberg Triarchic Abilities Test (STAT) designed to measure creative, analytical and practical skills, as distinct from the traditional Standardized Admissions Test (SAT) scores used in the United States to select students for entry to higher education, which he argues only focuses on analytical skills. The results showed that the STAT test was a much more consistent predictor of College outcome than the SAT. Not only was this a better predictor of achievement in higher education, there is evidence that white, middle class students are more likely to do well on the analytical skills aspect of the tests, whereas students from other ethnic backgrounds and lower socioeconomic status are more likely to develop creative and practical

skills. Sternberg argues that using a test system such as STAT alongside the SAT is more likely to provide both a meritocratic and diverse student population.

Sternberg notes, however, the difficulty faced with changing and improving college admissions procedures which he attributes to a range of factors. He lists these as including reliance on what he terms pseudo-quantitative precision, assessments which appear to have a scientific basis; publication of SAT results and the focus of education on raising these without understanding of what that means; culpability, in that admissions staff are concerned that changing admissions procedures could reduce students' achievement resulting in a declining reputation of the institution; and superstition which he describes as the belief that particular SAT scores are required for success. The practicalities of introducing a new selection tool for university admissions is not the only issue – a serious drawback with attempting to use a conscientiousness index would be that the data for this study was collected over an academic year, collecting evidence of behaviour over a period of time, rather than a single snapshot of likely behaviour.

9.3.2 Remediation of Conscientiousness

A practical approach would be to investigate possible remediation approaches with those students who fail to demonstrate strong conscientiousness behaviours while studying at Foundation level. Such remediation could include greater levels of peer support, explicit inclusion of strategies to increase levels of conscientiousness in study skills sessions or targeted interventions for students demonstrating low levels of conscientiousness at the start of a course. Poropat (2009) also suggested that the correlation of low conscientiousness with failure in capable students could be used to “predict which students are more likely to fail...and thus allow these students to be targeted for assistance programs” (2009, p. 331) and he suggests that “teaching methods may be adjusted to adapt to the specific personality styles of students in order to assist their learning” (2009, p. 331). It may be possible to use student

behaviours observed during induction week to provide a base-line CI score and identify early on students who would benefit from interventions to improve CI behaviours.

The work on whether conscientiousness is a fixed trait is inconclusive and a more sociological approach to generalised explanations of human behaviour tends to consider situational factors an important aspect of an individual's behaviour (Becker, 1964; Bloomer, 2001). Becker's description of situational adjustment states that if a person "has a strong desire to continue, the ability to assess accurately what is required, and can deliver the required performance, the individual turns himself into the kind of person the situation demands" (1964, p. 44). It may be that some students require more support in assessing what is required, perhaps due to a lack of cultural capital for the Higher Education situation, and that remediation activities may help students adjust to the situation. A paper by Li and Searle (2008) outlines a study demonstrating how a PhD supervisor supported a mature student in developing an identity as an academic using a process they refer to as "academic socialisation" with the supervisor explicitly engaging in judging the student's approaches and behaviours as either appropriate or inappropriate. Such explicit engagement with Foundation Programme students may have a similar outcome in terms of their development of an effective learner identity.

9.3.3 Explicit Teaching of Concepts of Evidence

The findings of this study indicate that the ability to use concepts of evidence in a project is a valuable aspect of a student's induction into the research-intensive community of practice at Durham University and consequently should be investigated further. As outlined in Chapter 5, understanding and being able to use concepts of evidence may be considered a threshold concept as outlined by Meyer and Land (2006). One aspect of threshold concepts is that they are generally based on substantive understanding, although when discussing troublesome knowledge

Perkins (2006) does describe epistemes as “a system of ideas or way of understanding that allows us to establish knowledge...As used here, epistemes are manners of justifying, explaining, solving problems, conducting enquiries and designing and validating various kinds of products or outcomes” (2006 p42). Certainly the research project into threshold concepts by Akerlind, McKenzie and Lupton (2011) considered one aspect of concepts of evidence, measurement uncertainty, to be a threshold concept. Buffler and Lubben (2001) also investigated undergraduate attitudes to unreliable data, particularly with regard to their use and understanding of point and set paradigms. They concluded that in order for students to develop both the concept of data uncertainty and the use the appropriate tools of statistical analysis, laboratory curricula should explicitly address the concepts underlying the experimental procedures.

Perkins describes epistemes as an example of tacit knowledge where teachers and successful students practise the epistemes automatically whereas other students may never fully understand the episteme because it is not addressed directly (Perkins, 2006). As Roberts (2001) states of concepts of evidence; “Some pupils will pick up these ideas in the course of the traditional study of science, but many will not. Many pupils will not understand how to evaluate scientific evidence unless the underlying concepts of evidence are specifically taught” (2001 p114). Analysis of biology education text books showed that references to concepts of evidence were normally implicit rather than explicit (Roberts & Gott, 2000).

This lack of explicit explanation of concepts of evidence is not just evident in science books. Analysis of critical thinking and study skills text books aimed at A level and degree level has shown that the majority of emphasis in critical thinking is focused on the language and rhetoric of argument rather than the logic and basis for the evidence e.g. validity and reliability of the evidence that is provided for the argument.

While critical thinking text books state that it is important to evaluate the evidence, there is very little information or advice on how to do this; the majority of the focus is on the language and format of arguments. For example, the book *Thinking Skills*, (Butterworth & Thwaites, 2005) which has 250 pages, devotes three chapters - 17 pages - to evidence and a whole section on data handling. The information on how to analyse the evidence contains no information about the reliability or validity of the evidence in terms of the sampling method to collect data or the statistics applied.

Another textbook *Critical Thinking for OCR Unit 2* by Lally, McBride and Wells (2006) use 10 of the 131 pages to consider evidence, but again there is little consideration of more scientific aspects of evidence, with ideas about reliability and validity limited to information on the use of percentages and how misleading they can be.

Surprisingly, the textbook *Study Skills for Science, Engineering and Technology* by Maier, Barney and Price (2009) makes no reference to evidence at all.

Whether concepts of evidence are to be considered threshold concepts or not, there is a good argument for teaching them explicitly. Lucas and Mladenovic (2007) address the need to develop different pedagogic practices to overcome barriers and for educators to be explicit about threshold concepts with students. Perkins (2006) describes 'pragmatic constructivism' as a way of acknowledging that different students will approach troublesome knowledge in different ways and using constructivism as a toolbox of pedagogic methods to suit the learners may help students overcome threshold concepts. Several papers address the need for concepts of evidence to be taught explicitly in the classroom. Gott and Roberts (2008) investigated the effects of explicit teaching of concepts of evidence on performance in both a written test of procedural understanding and in conduct of an investigation. They found that in their case study there was a significant increase in performance of both measures following teaching of concepts of evidence. While they conclude that it is unlikely that concepts of evidence alone were sufficient to

equip students to successfully carry out scientific investigations, they demonstrate that likewise, substantive knowledge was also insufficient. If these results are generalizable, there is clear pedagogic value in explicitly teaching concepts of evidence (Gott & Roberts, 2008).

9.4 Conclusion: Foundation Centres as a Model for Inducting Non-Traditional Students into the Higher Education Community of Practice

This thesis explored the factors affecting student success on a Foundation Programme in a research-intensive university, particularly in respect of the areas identified in the literature; initial education and learner identity. Success was measured by applying the concept that a successful outcome for students would be for them to be effectively inducted into the community of practice of a research-led degree programme. The link established between being able to apply concepts of evidence to a project and a good outcome on the Programme and the further correlation between doing well on the Programme and achieving a good honours degree, tends to support the use of the concept of induction into a community of practice as a way of identifying successful students. This in turn indicates that it may be useful to expand this further by explicitly teaching the concepts of evidence to ensure that students have the ideas about evidence to enable them to apply concepts about reliability and validity for example.

The literature on Access courses and vocational qualifications from Further Education Colleges indicated that the approach taken in Further Education may be different enough from that taken in Higher Education as to constitute a barrier for some students and that this Programme, being based in a Higher Education institution is likely to be in a better position to support students developing an appropriate learner identity for study in Higher Education. The Foundation

Programme acts as a “half-way house” for students into the main degree teaching of the university. The students use the same buildings as the more traditional students, they use the same library, eat in the same cafeteria, are bound by the same university regulations, are members of the same colleges, but for the first year of their university experience, they take their classes with other non-traditional students. They are able to build their confidence and skills and to acculturate and adapt to the new culture gradually, taking on some of the aspects of the new culture while having the support of other similar students around them. As the students learn the academic language and to develop a new conceptual organisation they begin to develop a new identity of a Durham University student; to be inducted into the community of practice. On being asked whether he saw himself as a Durham University student, one student interviewed in 2008 replied:

Probably yes. I would say I’m a university student definitely but obviously I’m coming to Durham so I’m a Durham University student. When people ask me what I’m doing I’m taking a degree at Durham University, so yeah I would describe myself as a Durham University student. Now I don’t know how else to describe myself, because I’m not a postman, I’m not a boilermaker I’m not just [name] any more, this is what I’m doing. So I am a university student.

Vince

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